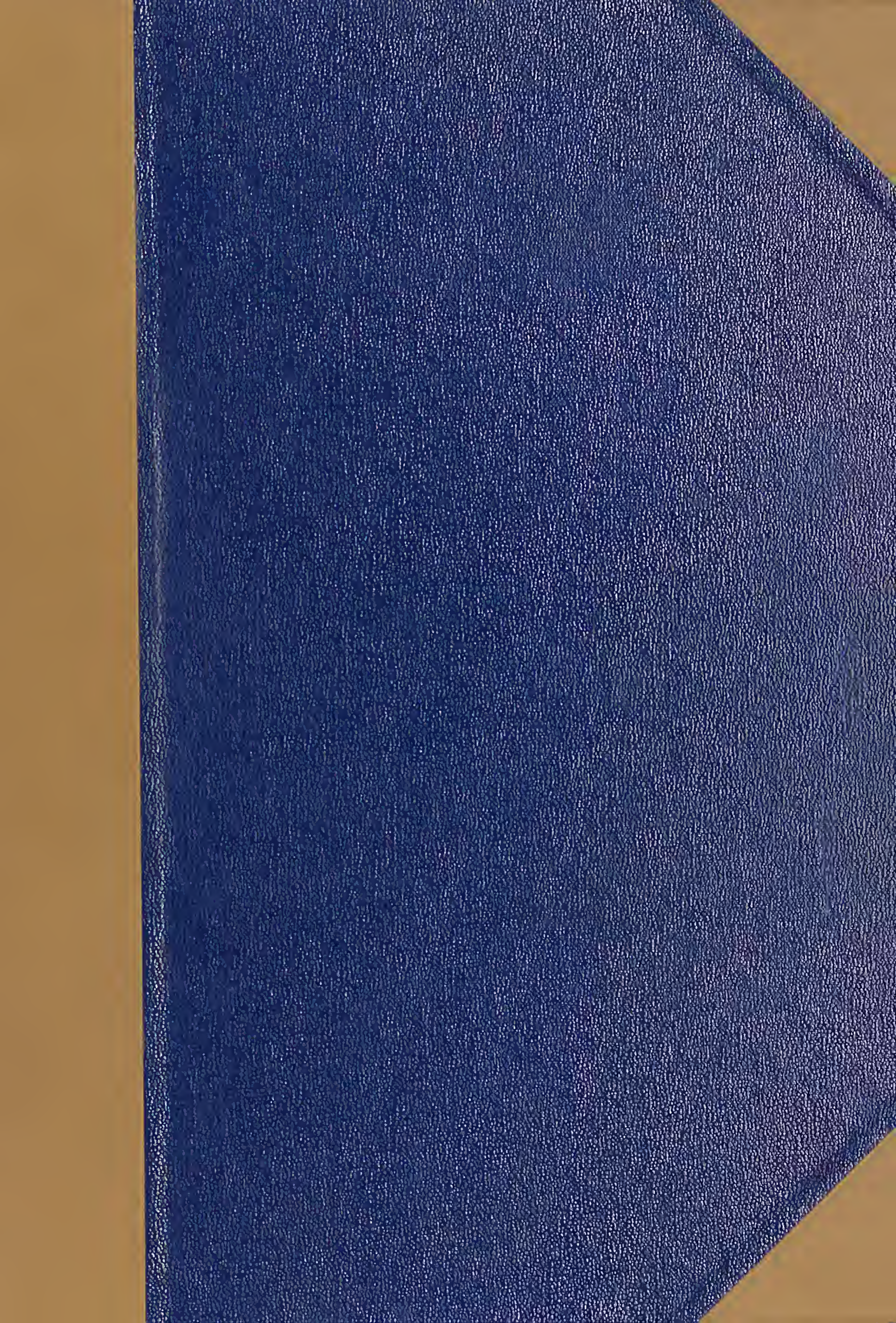






THE BIRDS OF
NORFOLK AND LORD HOWE ISLANDS
AND
THE AUSTRALASIAN SOUTH POLAR
QUADRANT.

12



*1/2 calf
Patt.*

THE
BIRDS
OF
NORFOLK & LORD HOWE ISLANDS
AND
THE AUSTRALASIAN SOUTH
POLAR QUADRANT

with Additions to

"The Birds of Australia"

by

GREGORY M. MATHEWS

Author of *"The Birds of Australia"*

WITH HAND-COLOURED AND MONOCHROME PLATES

H. F. & G. WITHERBY
326 HIGH HOLBORN, LONDON

1928

The Edition of this work is
strictly limited to 225 copies,
of which this is No. 94.

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AND

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PREFACE.

IN bringing out this book, I wish it clearly to be understood that it is not a Supplement to my *Birds of Australia*, although workers will find it a useful addition to that work.

I have divided the volume into two parts. In part I. are the birds of Lord Howe and Norfolk Islands; in part II. the birds of the South Polar region which lies below Australia, with the addition of those Australian birds that have come to hand lately. I should like to advocate the inclusion of all these birds in any future "List" of the birds of Australia. The birds of Lord Howe and Norfolk Islands belong nowhere else, and to include those of the South Pole would only mean the addition of some half a dozen species. I originally held this view and actually included those birds in my first "List" which appeared as a Supplement to the "Emu" for January 1908.

If we include the birds of the two islands, we get three new families and eleven new genera, that is, two each of Pigeons and Parrots and one each of the Rail, Cuckoo, Fly-eater, Caterpillar-catcher, Thrush, Silver-eye and Starling.

If we also include the South Polar region, we do not get any new families, but only one new genus and two new species of Penguin viz., *Aptenodytes forsteri* and *Dasyramphus adeliae*; two other genera and four species, *Thalassoica antarctica*, *Pagodroma confusa*, *Diomedea epomophora*, *Catharacta maccormicki*.

This makes a total of just over a couple of dozen new species to our List.

The following corrections must be made on page 8:—

Line five (end) of description, for "past" read "pair"; six lines further down for "181-6" read "166."

P. 47, last line, read "September to December."

GREGORY M. MATHEWS.

July 20th, 1928.

MEADWAY,
ST. CROSS,
WINCHESTER.

THE BIRDS OF
NORFOLK AND LORD HOWE ISLANDS.



H. Gronvold, del.

Witherby & Co.

HEMIPHAGA SPADICEA
(NORFOLK ISLAND PIGEON.)

HEMIPHAGA SPADICEA.

NORFOLK ISLAND PIGEON.

(PLATE 1.)

HEMIPHAGA Bonaparte, Compt. Rend. Acad. Sci. Paris, Vol. XXXIX., Dec. 4th, 1854, p. 1076.

Type (by original designation): *Columba novæseelandiæ* Gmelin.

Hemicarpophaga Salvadori, Cat. Birds Brit. Mus., Vol. XXI., p. 236, 1893 (after June 30th). New spelling only.

COLUMBA SPADICEA Latham, Index Ornith. Suppl., p. LX., 1801 (after May 30th): Norfolk Island.

Chestnut-shouldered Pigeon Latham, General Synops. Birds, Suppl., Vol. 2, p. 375, 1801: Norfolk Island.

Columba spadicea Latham, Index Ornith. Suppl., p. LX., 1801 (after May 30th): Norfolk Island; Temminck and Knip, Les Pigeons, 2nd fam., p. 1, pl. 1, 1809: Friendly Islands error= Norfolk Island; Selby, Natur. Library (Ornith., Vol. V.), Pigeons, p. 127, pl. IX., 1835.

Columba gigas Ranzani, Elem. Zool., Vol. III., pt. i., p. 223, July, 1821: Friendly Island error= Norfolk Island.

Columba leucogaster Wagler, Systema Avium, Colomba, sp. 12 (p. 231), Oct., 1827. New name for *C. spadicea* Latham.

Columba princeps Vigors, Proc. Zool. Soc. (Lond.), Sept. 20th, 1833, p. 78: Australia error= Norfolk Island; Jardine and Selby, Illustr. Ornith. N.S. (Vol. IV.), pl. v., pt. I., 1837.

Carpophaga spadicea G. R. Gray, List Spec. Brit. Mus., pt. iii., p. 6, 1844 (Aug. 1st.).

Hemiphaga spadicea Bonaparte, Compt. Rend. Acad. Sci. Paris, Vol. XXXIX., Dec. 4th, 1854, p. 1077; Salvadori, Cat. Birds Brit. Mus., Vol. XXI., 1893 (pref. June 30th); Rothschild, Extinct Birds, p. 161, pl. 21, 1907 (before June 19th); Mathews, Handl. Birds Austral., errata, p. 123, 1908 (Jan.); *id.*, Syst. Av. Australas, p. 54, June 13th, 1927.

Hemiphaga novæseelandiæ spadicea Mathews, Nov. Zool., Vol. XVIII., p. 452, Jan., 1912; *id.*, List Birds Austr., p. 326, 1913 (Dec.).

DISTRIBUTION. Norfolk Island (extinct).

Adult. Fore-head and fore-part of the crown metallic-green, changing into copper on the occiput, nape and hind-neck; lores, sides of face, ear-coverts, cheeks, chin, throat and chest metallic-green, strongly washed with golden-bronze; mantle violet-purple with a strong gloss; scapulars ash-grey, strongly washed with copper; lower back, rump and upper tail-coverts glossy greenish-grey; wing-coverts light grey, shaded with greenish-grey; primary-quills greyish, becoming almost white towards the base; tail-feathers blackish glossed with purple; breast, abdomen, flanks, thighs, under tail-coverts, under wing-coverts and axillaries pure white; under aspect of quills ash-grey. Total length 480 mm.: culmen 23, wing 258, tail (broken) 188, tarsus 33. Middle toe 38, hind-toe 20, inner toe 25, outer toe 28. Figured. Collected on Norfolk Island. Skin in Liverpool Museum.

The sexes are alike, the female being smaller. As the bird is extinct nothing is known of its life history.

Nests and eggs are not described.

JANTHÆNAS GODMANÆ.

LORD HOWE ISLAND PIGEON.

(PLATE 2.)

JANTHÆNAS Reichenbach, Nat. Syst. Vögel, p. xxv., 1852 (1853). Type (by original designation) : *Columba janthina* Temminck.

Raperia Mathews, Austral Av. Rec., Vol. III., p. 23, June 30th, 1915. Type (by original designation) : *Raperia godmanæ* Mathews.

RAPERIA GODMANÆ Mathews, Austral. Av. Rec., Vol. III., p. 24, June 30th, 1915: Lord Howe Island, Pacific Ocean.

Raperia godmanæ Mathews, Austral. Av. Rec., Vol. III., p. 24, June 30th, 1915; Mathews and Iredale, *ib.*, Vol. IV., p. 109, Dec. 16th, 1920; Mathews, Systema Av. Australas, p. 53, 1927.

Janthænas godmanæ Mathews, Syst. Av. Australas, p. viii., June 13th, 1927.

DISTRIBUTION. Lord Howe Island (extinct).

Adult. Head and breast purple-mauve; throat and upper neck white; mantle green; back and wing-coverts brown with the edges of the feathers lighter; abdomen and under tail-feathers brown; tail blackish-brown; primaries brown with the outer edges lighter, under aspect of wing lighter with shafts whitish. Legs red; eyes red, bare space round them dark red; base of bill and cere red, tip of both mandibles green. Total length about 400 mm.: bill 27, wing 220, tail 120, tarsus 46. The figure is that of the type from a drawing by George Raper in 1790, and called by him "Pigeon of Lord Howe Island."

Immature, nest and eggs. Unknown.

As I pointed out, this bird should be placed in the genus *Janthænas*, members of which occur on New Caledonia and Loyalty Islands, New Hebrides, Fiji and Samoa, Soloman Islands, Louisiade Archipelago, New Guinea, Timor and Molucca Islands.

This bird is closely related to *Janthænas halmaheira* (Bonaparte), who first described it in 1855, or sixty-five years after Raper* made his painting. Although this bird was supposed to have been discovered on Lord Howe Island, we must remember that a bird rather like it lives on the Duke of York Island.

The Ship "Waaksaamheydt," on which Raper came home, called at the Duke of York Island (St. George's Channel) and watered in May, 1791.

The date on the drawing of the Pigeon is 1790, so we have a vexed question here. There is no reason why this bird should not have been collected on Lord Howe Island. It is quite possible that all the forms of this genus are only subspecies of *vitiensis* of Quoy et Gaimard.

I am indebted to Mr. N. B. Kinnear for much help with the above.

*George Raper was on the H.M.S. "Sirius." Entered Long Reach on December 8th, 1786; was an able-bodied seaman up to September 30th, 1787. He then became a midshipman. He was paid off on board H.M.S. "Duke" in Portsmouth Harbour on May 16th, 1792; became Lieutenant, June 17th, 1793, and died in 1797.



Witherby & Co

JANTZENAS GODMANÆ
(LORD HOWE ISLAND PIGEON.)

H Grönvold. Lith



H. Gronvold. del.

TRICHOLIMNAS SYLVESTRIS
(LORD HOWE ISLAND RAIL)

Witherby & Co

TRICHOLIMNAS SYLVESTRIS.

LORD HOWE ISLAND RAIL.

(PLATE 3.)

TRICHOLIMNAS Sharpe, Bull. Brit. Orn. Club, Vol. I., p. xxviii., Jan. 26th, 1893. Type (by original designation): *Gallirallus lafresnayanus* Verreaux et des Murs.

Ocydromus SYLVESTRIS Selater, Proc. Zool. Soc. (Lond.), 1869, p. 472, pl. 35, April 1st, 1870 : Lord Howe Island.

Ocydromus sylvestris Selater, Proc. Zool. Soc. (Lond.), 1869, p. 472, pl. 35, April 1st, 1870 ; North, Rec. Austr. Mus., Vol. I., No. 1, p. 37, March 1890, pl. 1, egg.

Cabalus sylvestris Sharpe, Bull. Brit. Orn. Club, Vol. I., p. xxx., Jan. 26th, 1893 ; *id.*, Cat. Birds Brit. Mus., Vol. XXIII., p. 48, 1894 (pref. Feb. 27th).

Tricholimnas sylvestris Mathews, Nov. Zool., Vol. XVIII., p. 447, Jan. 1912 ; *id.*, List Birds Austr., p. 319, 1913 (Dec.) ; Mathews and Iredale, Austral. Av. Rec., Vol. II., p. 109, Dec. 16th, 1920 ; Mathews, Syst. Av. Australas, p. 84, 1927.

DISTRIBUTION. Lord Howe Island.

Adult male. General colour above, including the inner scapulars, lower back, rump and upper tail-coverts, olive-brown ; lesser, median and greater-coverts dull chestnut, widely barred with umber-brown ; primary-coverts dull chestnut, more narrowly barred with umber-brown ; quills dull reddish-chestnut, regularly barred across both webs with blackish-brown ; tail-feathers similar in colour to the back ; crown of head, occiput, nape, hind-neck and fore-head dull olive-brown ; lores, eye-brow, sides of face, ear-coverts, cheeks, chin and throat whitish-grey ; chest, breast, abdomen, sides of body, flanks and thighs olive-brown ; under tail-coverts olive-brown, barred with dull chestnut ; under wing-coverts and axillaries umber-brown, with bars of white, mixed with chestnut-red ; quills below chestnut, regularly barred with dull umber-brown ; bill dark horn-grey ; feet dark grey ; eyes red. Total length 420 mm. : culmen 53, wing 143, tail 68, tarsus 52. Figured. Collected on Mt. Gower, Lord Howe Island, on the 30th of June, 1914.

Adult female. Similar to the adult male. Total length 377 mm. : culmen 48, wing 138, tail 63, tarsus 46. Collected on Mt. Gower on the 13th of June, 1914.

Immature female. Rather like the adult. General colour above dull tawny-buff, lightest on the top of the head ; scapulars like the back, secondaries barred with rufous-chestnut ; lower back, rump and upper tail-coverts rich tawny-buff ; lesser and median wing-coverts coloured like the back ; primaries and primary-coverts chestnut, regularly barred with black ; tail-feathers reddish-brown, the outermost pairs indistinctly barred with black ; crown of the head, occiput, nape, hind-neck and fore-head tawny-buff ; sides of the face, ear-coverts and cheeks isabelline-buff ; chin and throat isabelline-grey ; sides of neck and fore-neck brownish-buff ; chest, breast and abdomen reddish-buff ; sides of the body, flanks and thighs reddish-buff, indistinctly barred with whitish-buff ; under tail-coverts chestnut, barred with blackish-brown ; under wing-coverts and axillaries

LORD HOWE ISLAND RAIL.

pale chestnut, barred with blackish-brown; quills below, chestnut, barred with blackish-brown; bill dark grey, feet very dark grey, eyes brown. Collected on Little Slope, Lord Howe Island, on the 12th of February, 1914.

Eggs. A clutch of two eggs was found on the 8th of January, 1914, on the top of Mount Gower. They look like gigantic Water Rails' or *Hypotaenidia philippensis* eggs. They have not much gloss, the ground-colour is pinkish-cream, and they are marked with spots and patches of red-brown and pale-purplish or purplish-grey patches. They measure: 49.8×36.2 and 48×37.2 mm.*

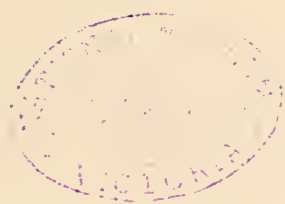
Nest. A depression in the leaves, under low foliage.

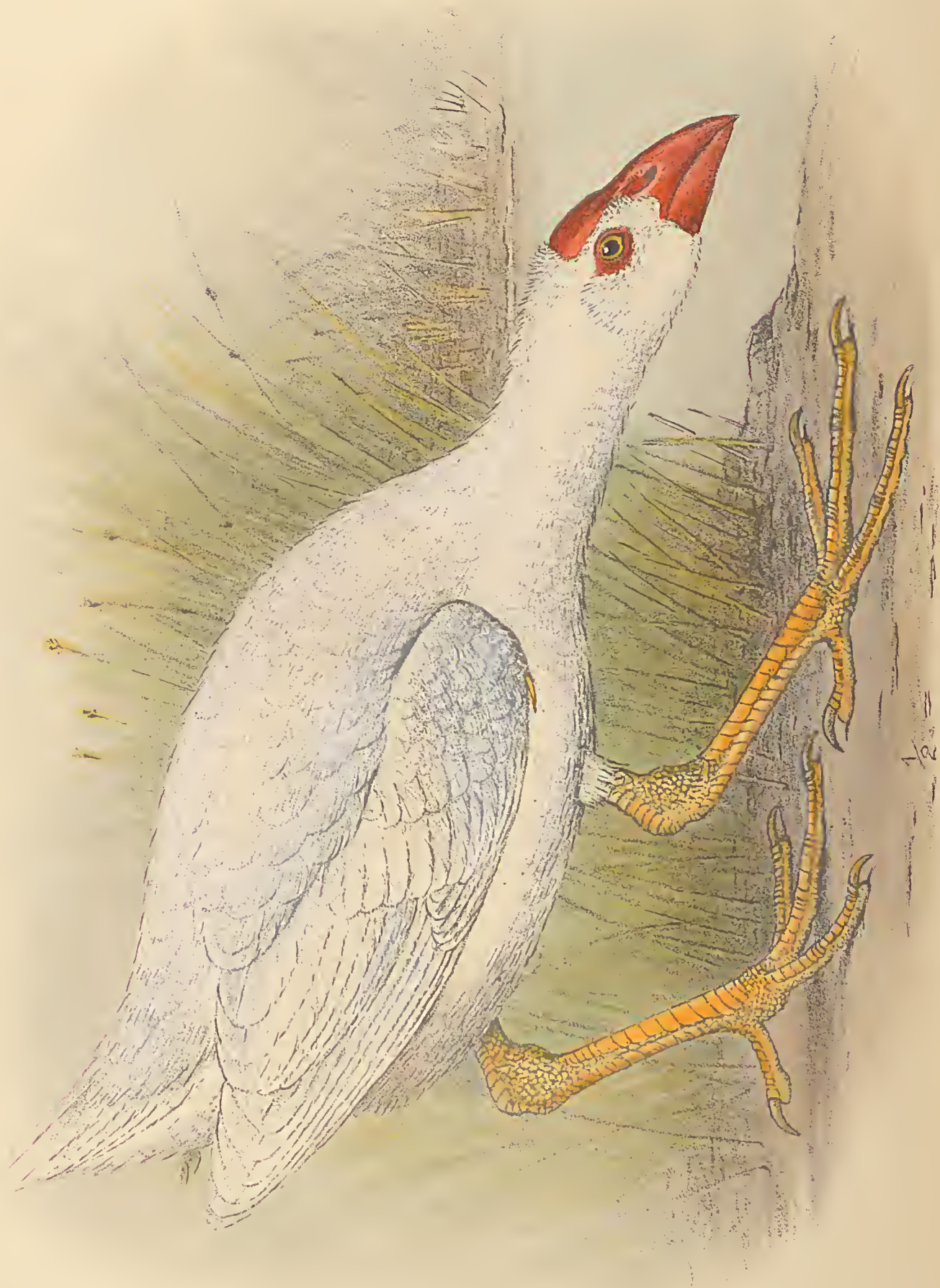
Eggs. Clutch four; dull white, with minute dots and large irregular shaped markings of light chestnut-red, more or less scattered over the surface of the shell, obsolete marking of the same colour predominating towards the larger end, 48-51 mm. by 33-35.

Breeding-season. October, November and January.

AMONGST the Raper drawings is a splendid painting of this bird done in 1790, on Lord Howe Island, about eighty years before it was described by Sclater. It differs from the type of the genus *Tricholimnas* in having the feathers of the back and wings less fluffy; it could be placed in a new sub-genus SYLVESTRORNIS and called *Sylvestrornis sylvestris* (Sclater).

*Dr. E. Hartert described this, and most of the eggs, from material from my collection, now in Tring Museum.





PORPHYRIO ALBUS
(WHITE SWAMP - LUNN)

PORPHYRIO ALBUS.

WHITE SWAMP-HEN.

(PLATE 4.)

PORPHYRIO Brisson, Ornith., Vol. I., p. 48 ; Vol. V., p. 522, 1760. Type (by tautonymy):
Porphyrio=*Fulica porphyrio* Linné.

Cæsarornis Reichenbach, Nat. Syst. Vog., p. xxi., 1852 (1853). Type (by monotypy): *Gallinula poliocephala* Latham.

FULICA ALBA White, Journ. Voy. New South Wales, p. 238 and plate, 1790 (before August): no locality.

White Gallinule Phillip, Voyage. to Botany Bay, p. 273 and plate, 1789: Lord Howe Island and Norfolk Islands.

Fulica alba White, Journ. Voy. New South Wales, p. 238 and plate, 1790 (before Aug.).

Gallinula alba Latham, Index Ornith., Vol. II., p. 768, 1790, before December: Norfolk Island.

Porphyrio albus Temminck, Man. d'Ornith., Vol. II., p. 701, 1820 (before Oct. 21st); Mathews, Birds Austr., Vol. I., pt. 5, p. 247 with fig., p. 251, Oct. 31st, 1911; *id.*, Nov. Zool., Vol. XVIII., p. 452, January 1912 (Lord Howe Island); *id.*, List Birds Austr., p. 326, 1913 (Dec.); Mathews and Iredale, Austral. Av. Rec., Vol. IV., p. 109, Dec. 16th, 1920; Mathews, Syst. Av. Australas., p. 102, June 13th, 1927.

Notornis alba Pelzeln, Sitz. akad. der Wiss., Vol. XLI., p. 328, 1860 (after June 8th): Norfolk Island; Salvin, Ibis, July 1873, p. 295, pl. x.; Sharpe, Cat. Birds Brit. Mus., Vol. XXIII., p. 208, (pref. Feb. 27th) 1894; Rothschild, Extinct Birds, p. 144, pl. 33, 1907 (before June 19th): Norfolk Island; Mathews, Handl. Birds Austral., p. 14, 1908 (Jan.).

DISTRIBUTION. Lord Howe Island (extinct).

Adult. Pure white; legs yellow; bill and shield red; eyes golden-yellow (taken from type figure). Total length of type skin 545 mm.: wing 228; culmen with shield 79; tail 75; tarsus 92; middle toe with claw 88, without claw 77; hind-toe with claw 45, without 32; inner toe with claw 71, without 56; outer toe with claw 74, without 63; tail 75.

Immature, nest and eggs. Unknown.

IN my *Birds of Australia*, Vol. I., pp. 247-254, 1911, I gave a full history of this bird. Nothing more has come to light. The unique specimen is in Vienna; my friend, Dr. M. Sassi, has had this drawn, and has also sent me the above measurements. This is the first time that the type has been figured and measured for very many years.

WHITE SWAMP-HEN.

In the original figure the spur on the wing is shown; no other figure shows this. In the skin in Vienna the right wing has a spur about 7.5 mm. and of a light horn-colour, the other wing has only a knob, but the spur has not been broken off.

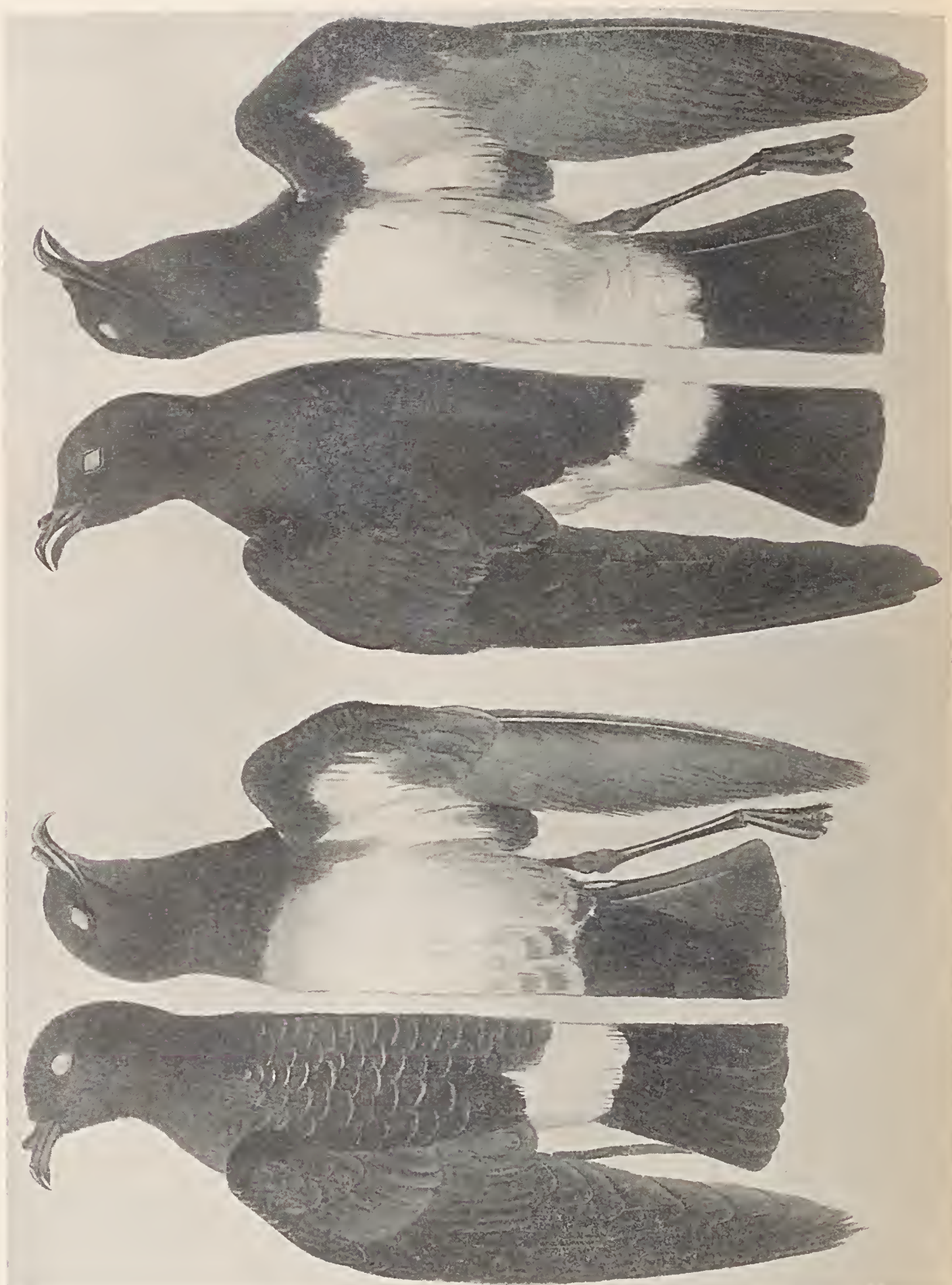
The figures quoted above have the middle toe and claw about equal to the tarsus.

This brings us to a painting by George Raper, who drew this bird in 1790. No spur is shown on the wing, the tarsus is twice the length of the middle toe. It is a *Porphyrio* pure white; legs, bill and shield red; eyes dark brown. The drawing is said to be half natural size. This would make it a large bird, roughly as follows. Total length 640 mm.: wing 320; bill with shield 104; tarsus 186, middle toe 90, hind-toe 62. This description of Raper's drawing can be called *Porphyrio raperi* sp. nov.

As the type of *albus* differs from the type of the genus *Porphyrio* in having a large spur on the wing, I make the genus *Kentrophorina* for it, and it can be known as *Kentrophorina alba* (White).

The oldest name for the Swamp-Hen is *cyanophalus*, which comes before *calvus* in the same page in 1819.





FREGETTA TUBULATA

CYMODROMA INSULARIS

FREGETTA TUBULATA.

ALLIED STORM-PETREL.

(PLATES 5 AND 10.)

FREGETTA Bonaparte, Comptes Rendus Acad. Sci., Paris, Vol. XLI., p. 1113, Dec. 31st, 1855.

Type (by original designation): *Thalassidroma leucogaster* Gould.

FREGETTA TUBULATA Mathews, Birds Austr., Vol. II., pt. 1, p. 42, May 30th, 1912: "Near the coasts of Australia."

Fregetta tubulata Mathews, Birds Austr., Vol. II., p. 42, May 30th, 1912 (ex Gould MS.); Mathews and Iredale, Man. Birds Austr., Vol. I., p. 20, March 9th, 1921; Kinghorn and Cayley, Emu, Vol. XXII., pp. 81-96, Oct. 1922; Mathews, *ib.*, Vol. XXIII., pp. 51-56, July 1923; *id.*, Syst. Av. Australas., p. 109, June 13th, 1927.

DISTRIBUTION. "Near the coasts of Australia."

Adult (type of species). General colour above blackish-brown, darker on the head; the feathers of the back, scapulars, lower-back and rump narrowly margined with white; the longer upper tail-coverts pure white, the shorter upper tail-coverts brownish-black, white at the base and narrowly tipped with white; lesser wing-coverts blackish-brown; median and greater coverts ash-brown; primary-coverts blackish-brown; primary-quills blackish with a slight gloss and brownish-black towards the margins of the inner webs; the middle pair of tail-feathers black, the remainder black, with white bases; crown of head, occiput, nape, hind-neck and fore-head sooty-black; chin and throat smoky-black, white at the bases of the feathers; sides of neck, fore-neck and upper chest smoky-black, with the bases of the feathers white; breast, sides of the body and the abdomen white, broadly tipped with smoky-black; under tail-coverts blackish-brown with the basal half white; lesser wing-coverts smoky-brown; median under wing-coverts and axillaries white; quills below brownish-ash with the shafts of the primaries horn-colour. Total length about 205 mm.; culmen 14, wing 150, tail 74, tarsus 36, middle toe with claw 25. Figured. Collected "Near the coasts of Australia."

NOTHING is known of this bird, except that Gould said he obtained it near the coast of Australia.

GENUS—CYMODROMA VIEILLOT.

Key to the Species.

- | | |
|---|---------------------------------|
| All black | <i>Cymodroma royana.</i> |
| Under-surface white | |
| Inside lining of wings white | |
| White edgings of most of the feathers | |
| on the upper-surface at all stages | <i>C. grallaria innominata.</i> |
| No white edgings to any of the feathers | |
| on the upper-surface at any stage | <i>C. insularis.</i> |
| Inside lining of wings greyish-brown .. | <i>C. alisteri.</i> |

CYMODROMA GRALLARIA.

(INNOMINATA.)

WHITE-BELLIED STORM-PETREL.

(PLATES 6 AND 10.)

CYMODROMA Ridgway, Mem. Mus. Comp. Zool. Harvard (Water Birds, North America, Vol. II.), Vol. XIII., pp. 363, 418, 1884 (introd. March 31st). Type (by monotypy): *Procellaria grallaria* Vieillot.

Fregettornis Mathews, Birds Austr., Vol. II., p. 31, May 30th, 1912. Type (by original designation): *Procellaria grallaria* Vieillot.

PROCELLARIA GRALLARIA Vieillot, Nouv. Diet. Hist. Nat., Vol. XXV., p. 418, Dec. 26th, 1818: Australian seas error=Juan Fernandez (breeding) off South America (cf. Murphy, Amer. Mus. Novit., No. 124, p. 9, 1924).

Fregettornis innominatus Mathews, Austral. Av. Ree., Vol. II., p. 124, Jan. 28th, 1915: Lord Howe Island; Kinghorn and Cayley, Emu, Vol. XXII., pp. 81-96, 1922 (Oct.); Mathews, *ib.*, Vol. XXIII., pp. 51-56, 1923 (July); Murphy, American Mus. Novit., No. 124, p. 9, July 22nd, 1924; Hartert, Nov. Zool., Vol. XXXIII., p. 356, Dec. 1926.

Fregettornis grallarius Mathews and Iredale, Austral. Av. Ree., Vol. IV., p. 108, Dec. 16th, 1920; *id.*, Man. Birds Austr., Vol. I., p. 21, March 9th, 1921: Lord Howe Island.

Cymodroma grallaria insularis Mathews, Syst. Av. Australas., Vol. I., p. 110, June 13th, 1927.

DISTRIBUTION. Lord Howe Island [Rapa Island, Austral Group].

Adult female. Black on the head and neck; mantle, back and scapulars blackish-brown, the feathers narrowly margined with white; median wing-coverts lighter, the feathers narrowly edged with white; lesser wing-coverts, bastard-wing, primary-coverts and quills black; rump and upper tail-coverts white, some of the feathers with black near the tip; tail-feathers black, with white on the inner webs at the base of all but the middle part; breast, abdomen, axillaries and inner under wing-coverts pure white; smaller coverts round the margin of the under-wing black; under tail-coverts black with white bases; bill and feet black; iris brown. Total length 215 mm.: culmen 14, wing 164, tail 80, tarsus 37. Type of *innominatus*. Collected at the Pines on Lord Howe Island on the 21st of May, 1914.

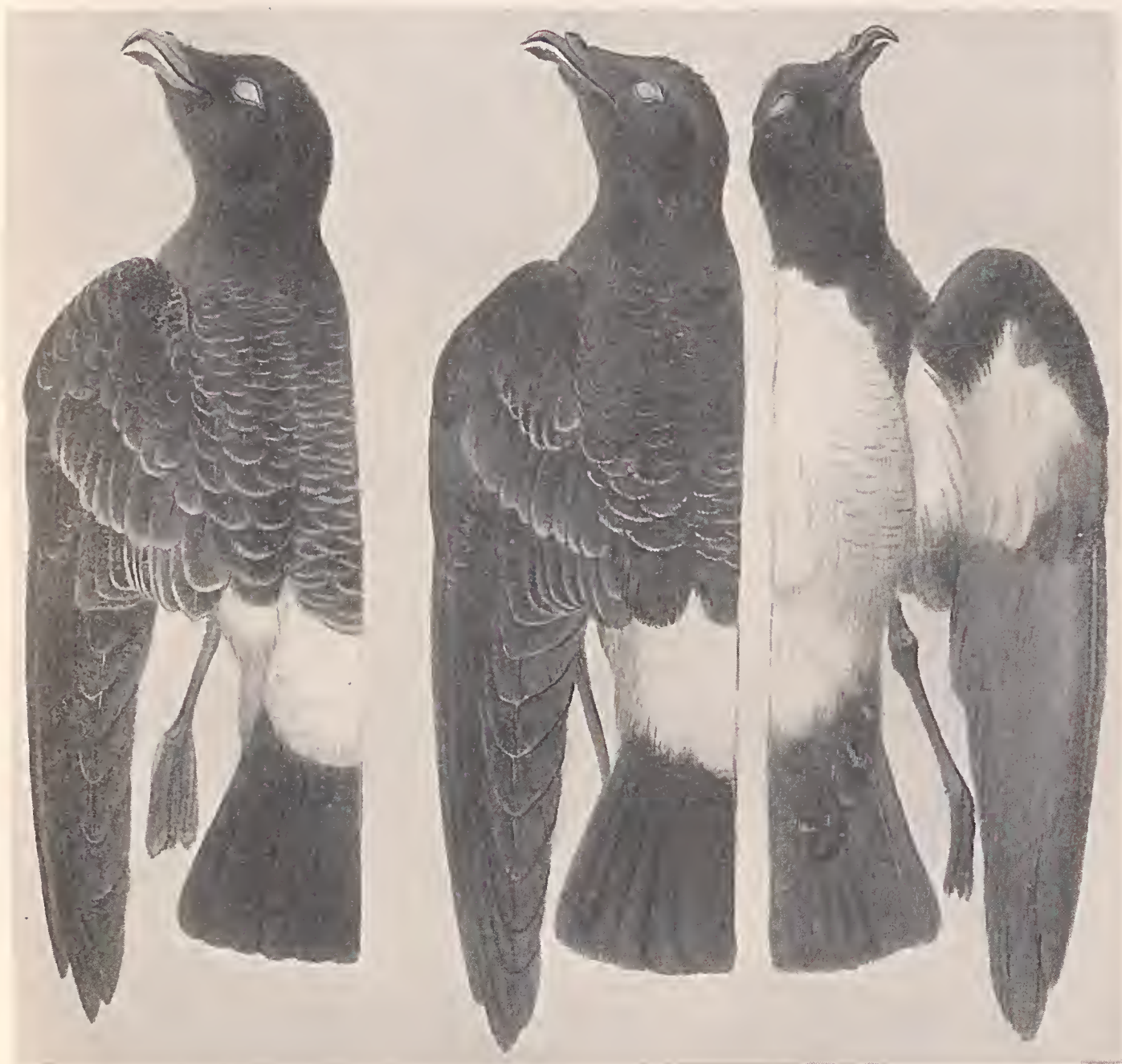
Adult male. Similar to the adult female, but larger wing averaging 181-6.

Immature. Similar to the above. Wing 158, tail 80, tarsus 36.5, culmen 14. Collected on the 26th of May, 1914, at the Pines, Lord Howe Island.

Nest. A tunnel excavated about eighteen inches in a bank; the end enlarged to a hole about five inches in diameter and lined with a little dead grass on the bottom to form a nest.

Egg. Clutch, one; dull white, slightly spotted at the larger end with reddish-brown. Dimensions 33.5 by 25 mm.

Breeding-season. January (Lord Howe Island).



CYMODROMA ⁴/₅ INNOMINATUS

WHITE-BELLIED STORM-PETREL.

As given above, the genera *Fregetta* and *Fregettornis* (= *Cymodroma*) were worked up in the Twenty-second Volume of the *Emu*, and the conclusion reached that the four names given to *Fregettornis* all applied to the same bird.

The next worker on *grallaria* was Dr. R. C. Murphy, as above. He also considered my three "species" from Lord Howe Island identieal. He writes: "The important point is that the *Fregetta grallaria* of the western South Pacific is a different race from that inhabiting the waters off the west coast of southern South America. The distinction is one of size, and the following figures are more revealing than pages of description."

He then gives measurements of five breeding males from southern South America as averaging:—Wing 153·9 mm., tail 72·8, exposed culmen 13·3, tarsus 35·2, middle toe with claw 21·2; and five breeding males from Rapa Island, Austral Group, as averaging:—Wing 181·6 mm., tail 82, exposed culmen 15·3, tarsus 40·5, middle toe with elaw 25.

"The indicated differences are so great that they are not bridged, or even nearly bridged, by individual variation amongst scores of specimens studied.

"Kinghorn and Cayley have taken the pains to publish a sketch and the measurements of Vieillot's type skin [I had already given the measurements of Vieillot's type in my *Birds of Australia*, Vol. II., p. 41, July 31st, 1912, as wing 150 mm.; culmen exposed 13; tarsus 35; tail 69; middle toe, without claw 19.] These authors follow tradition in considering the seas of 'Nouvelle Holland' as the type locality; but their own figures contradict them, for the dimensions of the type match those of the Juan Fernandez specimens given above. Therefore, although Mathews neglected to record the evidence, his conclusion appears to be correct."

Murphy then accepts Juan Fernandez as the breeding ground of *grallaria* typical and says: "Fledgings taken at Rapa have down of a much lighter grey than Juan Fernandez chicks of the same stage of growth. The contour feathers of the dorsal surface, which are broadly edged with white, are also lighter in the young Rapa birds. The difference in size is, however, the outstanding distinction, for downy chick from Rapa have larger bills than adult birds from Juan Fernandez."

Gould's *Thalassidroma leucogaster* is a species, killed 36° S. 6° 47' E. South Atlantic Ocean off Cape Town, and Salvadori's *Fregetta melanoleuca* must be revived.

CYMODROMA INSULARIS.

ALLIED WHITE-BELLIED STORM-PETREL.

(PLATES 5, 8* AND 10.)

FREGETTORNIS INSULARIS Mathews, Austral. Av. Rec., Vol. II., p. 124, Jan. 28th, 1915: Lord Howe Island.

Fregettornis insularis Mathews, Austral. Av. Rec., Vol. II., p. 124, Jan. 28th, 1915; Mathews and Iredale, *ib.*, Vol. IV., p. 108, Dec. 16th, 1920; Kinghorn and Caley, Emu, Vol. XXII., pp. 81-96, Oct. 1922; Mathews, *ib.*, Vol. XXIII., pp. 51-56, July 1923.

?*Fregettornis alisteri* Mathews, Austral. Av. Rec., Vol. II., p. 124, Jan. 28th, 1915: Lord Howe Island; Mathews and Iredale, *ib.*, Vol. IV., p. 108, Dec. 16th, 1920.

Cymodroma grallaria insularis Mathews, Syst. Av. Australas., p. 110, June 13th, 1927.

DISTRIBUTION. Lord Howe Island.

Adult female. General colour of the upper-surface blackish-brown, including the head, back and upper wing-surface; median wing-coverts lighter; rump and upper tail-coverts white; the feathers of the lower back are white with black tips; tail-feathers black with white on the inner web at the base of all but the middle pair; breast, abdomen, axillaries and inner under wing-coverts white; smaller coverts round the margin of the wing brown; under tail-coverts black with large white bases; the white feathers on the side of the body have dark median lines; bill, feet and legs black. Wing 168 mm.; culmen 13, tail 80, tarsus 38. Collected on the west coast of Lord Howe Island on the 2nd of February, 1914, and is the type of *insularis*.

Sexes alike.

Immature. Like the adult.

Nest. A tunnel, enlarged at the end.

Egg. Clutch one, taken on February 2nd, 1914. White and glossless, 36.5 × 25.6 mm.

Breeding-season. February 2nd.

No. 7a.

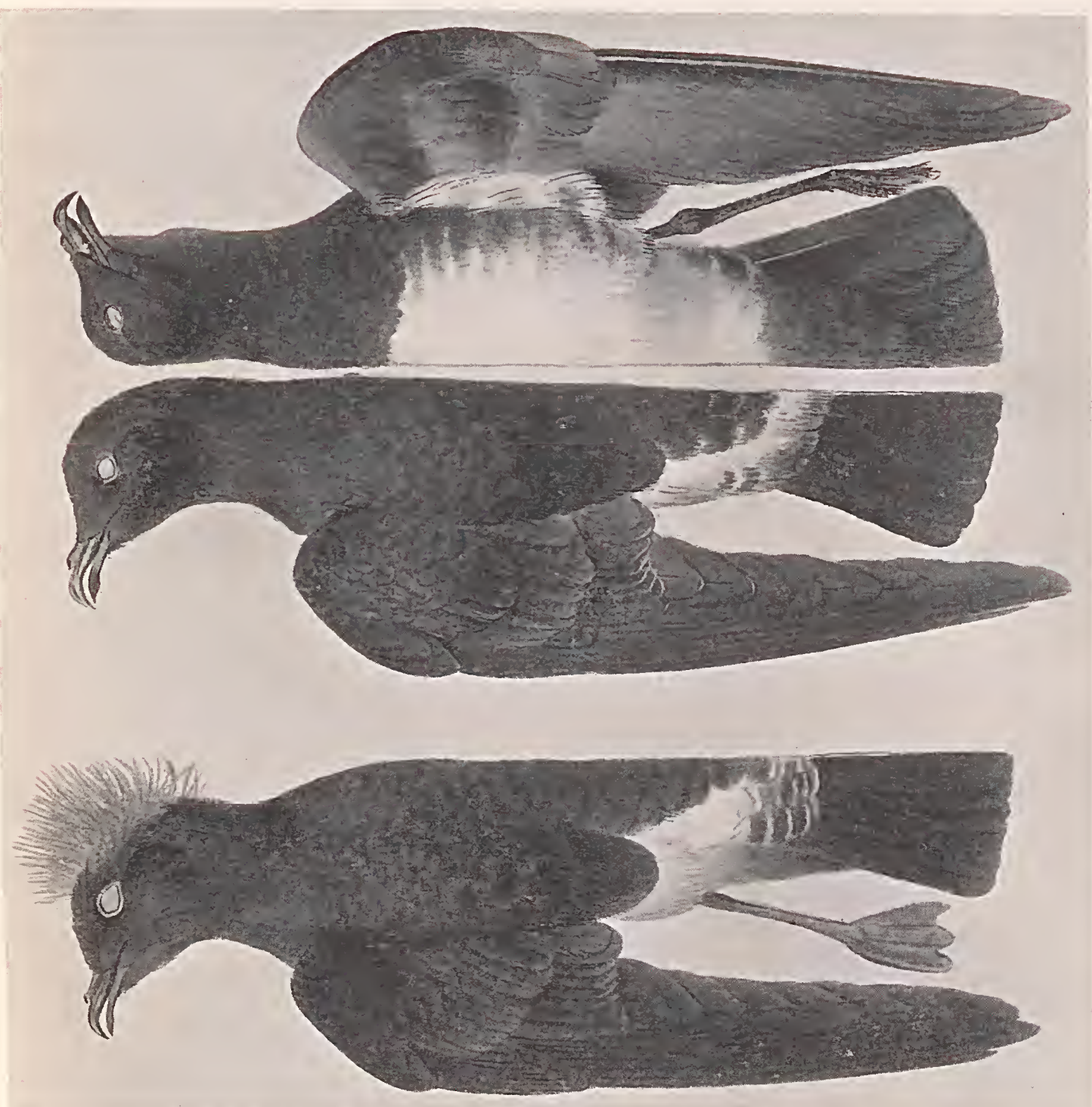
CYMODROMA ALISTERI.

(PLATES 7 AND 10.)

Fregettornis alisteri Mathews, Austral. Av. Rec., Vol. II., p. 124, Jan. 28th, 1915: Lord Howe Island.

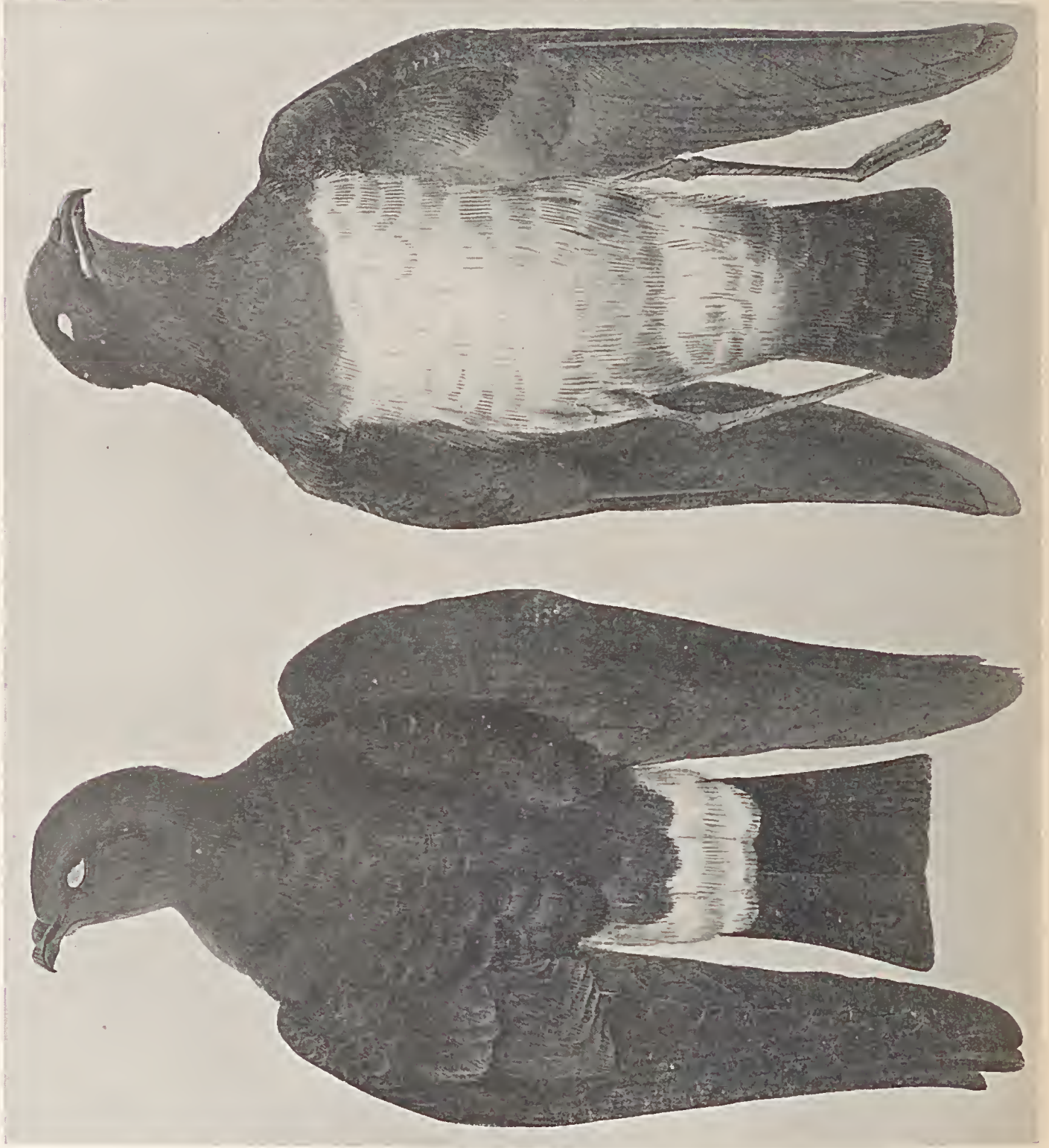
THE adult female type of *alisteri* differs from the above in having the inner under wing-coverts greyish-brown, not pure white; the axillaries the same

*Plate 8 is lettered *C. howensis*.



Immature $\frac{4}{5}$ CYMODROMA ALISTERI Adult





CYMODROMA ²/₂ *HOWENSIS*

ALLIED WHITE-BELLIED STORM-PETREL.

colour and with white bars; the white feathers on the side of the body lack the dark median lines and instead have narrow dark-brown margins; the upper tail-coverts have wide blackish ends, these almost hiding the white rump; culmen 13 mm., wing 165, tail 75, tarsus 36. Collected on the south-west beach of Lord Howe Island on September 23rd, 1913.

Another adult female collected on the same island, on King's Beach, on May 16th, 1914, agrees with the type: wing 156 mm., tail 76, tarsus 36, culmen 14.

An immature, with down adhering to the head, also agrees with the type. Collected at Mt. Nichols, Lord Howe Island, on May 9th, 1914. Wing 158 mm., tail 74, tarsus 36, culmen 13.5.

These three birds agree in having the white rump almost hidden by blackish feathers. It is difficult, at present, to consider them identical with *insularis*. Neither immature or adult of *alisteri* have the white edges to any of the feathers on the upper-surface, thus marking them off from *grallaria*, which at all stages of its career has these white margins to the feathers on the back, etc., neither does *insularis* have these white margins.

Another specimen which I figure on pl. 8 also agrees in having the inner lining of the wings and axillaries as in *alisteri*. Culmen 14 mm., wing 161, tarsus 36: Lord Howe Island. In my MS. I have called this *C. howensis*.

In *C. grallaria innominata* the black head is noticeably marked off from the lighter feathers of the back; the lower back feathers are always narrowly margined with white; the white rump is most pronounced as, also, is the pure white inner under wing-coverts; the black under tail-coverts are margined with white at the tips. In *alisteri* these latter feathers have no white tips.

After working up these birds again and examining a long series of over 60 skins, including downy young, I consider *grallaria innominata* a good subspecies, and *insularis*, *alisteri* and *royana* three species.

I have had drawings made of all these forms and must leave it for future workers with more material to settle the standing of these difficult birds.

Order PROCELLARIIFORMES.

No. 8.

Family THALASSIDROMIDÆ.

CYMODROMA ROYANA.

BLACK STORM-PETREL.

(PLATES 9 AND 10.)

FREGETTORNIS ROYANA Mathews, Austral. Av. Rec., Vol. II., p. 86, Sept. 24th, 1914 : Lord Howe Island.

Fregettornis royana Mathews, Austral. Av. Rec., Vol. II., p. 86, Sept. 24th, 1914 ; Mathews and Iredale, *ib.*, Vol. IV., p. 108, Dec. 16th, 1920 ; Kinghorn and Caley, Emu, Vol. XXII., pp. 81-96, Oct. 1922 ; Mathews, *ib.*, Vol. XXIII., pp. 51-56, July 1923.

Cymodroma royana Mathews, Syst. Av. Australas., p. 110, June 13th, 1927.

DISTRIBUTION. Lord Howe Island.

Adult male. Entire plumage sooty-black, darkest on the upper tail-coverts ; wings and tail black. A large sub-terminal band of white is noticeable on the under-surface and the upper tail-coverts when the feathers are examined. Bill, feet and legs black, eyes dark brown. Total length 225 mm. : culmen 13, wing 160, tail 79, tarsus 35. Collected at Mr. P. Digmans, on Lord Howe Island, on the 3rd of March, 1914, and is the type of *royana*.

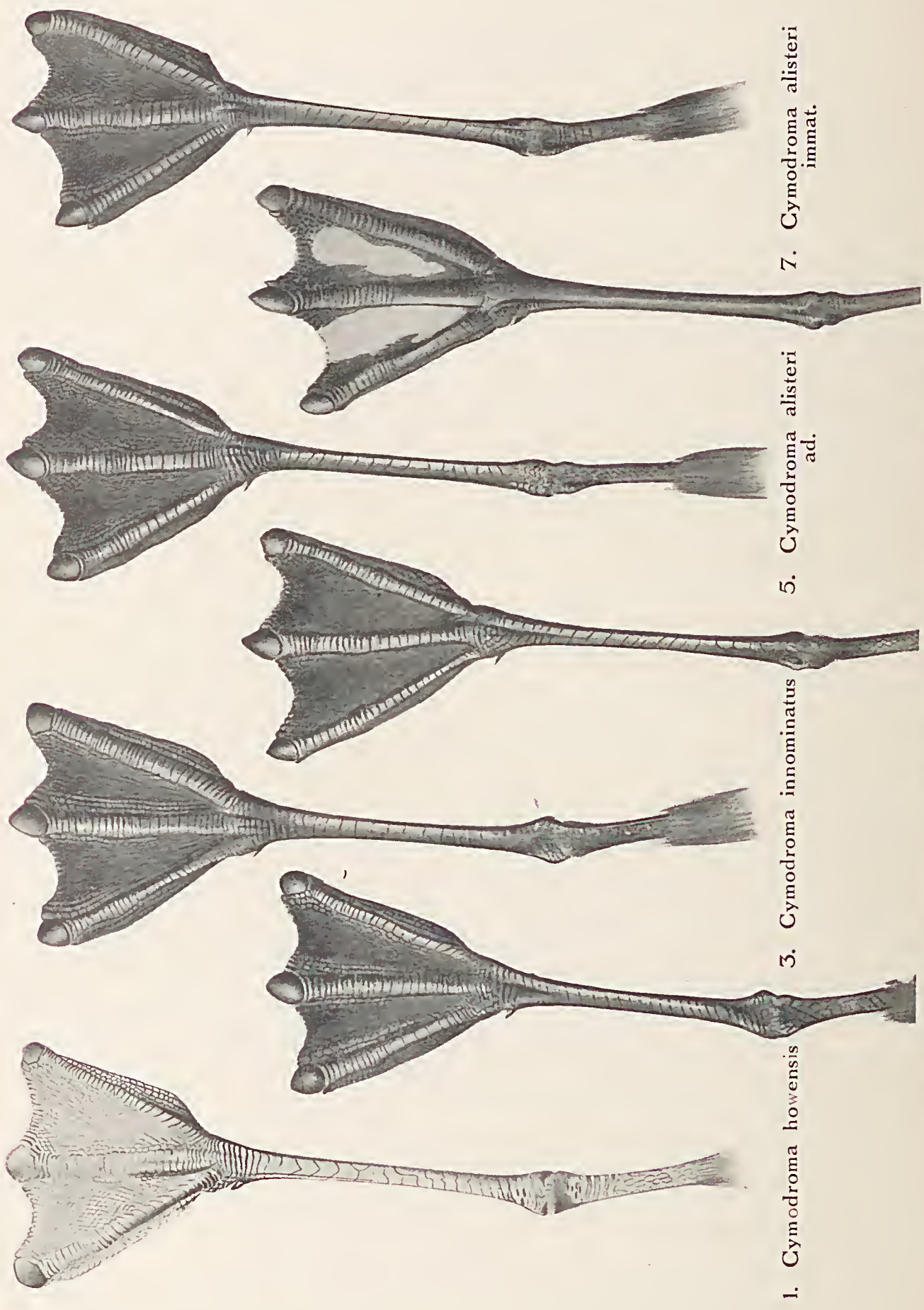
Sexes. Alike.

Nest and eggs. Probably similar to other forms in this genus.

I CAN see no reason to suppose this bird to be a melanistic form of any other. Mr. Roy Bell, who collected for me, sent me a great number of the wings of this bird.



$\frac{4}{5}$
CYMODROMA ROYANA



1. *Cymodroma howensis* 3. *Cymodroma innominatus* 5. *Cymodroma alisteri* ad. 7. *Cymodroma alisteri* immat.

2. *Cymodroma royana* 4. *Cymodroma insularis* 6. *Fregatta tubulata*

PUFFINUS ASSIMILIS.

LITTLE SHEARWATER.

PUFFINUS Brisson, Ornith., Vol. I., p. 56, Vol. VI., p. 130, 1760. Type (by tautonymy): *Puffinus*=*Procellaria puffinus* Brünnich (for synonyms, cf. Syst. Av. Australas., p. 110, 1927, or my Check List, p. 19, 1920).

PUFFINUS ASSIMILIS Gould, Synops. Birds Austr. and Adj. Isl., pt. iv., App., p. 7, April 1st, 1838: Norfolk Island.

Puffinus assimilis Gould, Synops. Birds Austr. and Adj. Isl., pt. iv., App., p. 7, April 1st, 1838; *id.*, Birds Austr., pt. xxxv., Vol. VII., pl. 59, Dec. 1st, 1848; Salvin, Cat. Birds Brit. Mus., Vol. XXV., p. 384, 1896 (pref. July 30th); Godman, Monogr. Petrels., p. 133, pl. 35, March, 1908; Mathews, Birds Austr., Vol. II., p. 50, May 30th, 1912; *id.*, List Birds Austr., p. 33, Dec. 1913; *id.*, Check List Birds Austr., p. 19, Feb. 16th, 1920; Mathews and Iredale, Man. Birds Austr., p. 23, March 9th, 1921; Mathews, Syst. Av. Australas., p. 110, 1927.

Puffinus affinis Anon, Penny Cyclop., Vol. XVIII., p. 42, 1840, error for *assimilis*.

Puffinus australis Gould, Birds Austr., pt. xxxv., Vol. VII., Dec. 1st, 1848, text to plate 59, as synonym of *assimilis* (ex Eyton MS.).

Puffinus nugax Bonaparte, Consp. Gen. Av., Vol. II., p. 205, Oct. 1st, 1857; Gould, Handb. Birds Austr., Vol. II., p. 458, Dec. 1865.

Puffinus assimilis howensis Mathews, Austral. Av. Rec., Vol. II., p. 125, Jan. 28th, 1915: Lord Howe Island.

DISTRIBUTION. Lord Howe and Norfolk Islands.

Adult female. General colour above slaty-black; scapulars, lower back, rump, upper tail-coverts and wing-coverts black, with concealed basal two-thirds dark grey; primary-quills dark silvery-grey, with the margins of the outer webs and the inner webs of the primaries and secondaries white on the basal half; tail-feathers black, powdered with silvery-grey; fore-head and crown of head black; occiput, nape, hind-neck, lores, sides of the face, ear-coverts, cheeks, chin, throat and remainder of the under-parts snow-white; under tail-coverts, almost reaching to the tips of the tail, white; quills below ash-coloured, becoming white towards the inner web; under wing-coverts and axillaries white. Bill blue and black, eyes very dark brown, feet bright blue. Total length 255 mm.: culmen 23, wing 171, tail 65, tarsus 40. Collected on Bird Rocks, Norfolk Island, on the 9th of August, 1912.

Adult male. Similar to the adult female.

Eggs. The clutch consists of one egg only and like those of other *Puffini* are placed in deep burrows. They are white, without or with a faint trace of gloss; held against the light they appear creamy. The shape is elliptical ovate. Measurements: 49 × 35.5, 52 × 35, 50 × 36.5, 52 × 36.7, 56 × 35.6, 47.7 × 55.5, 51 × 36, 51 × 35, 52 × 36.4, 48.5 × 37, 53.7 × 35.5, 52.7 × 35.5, 51 × 36, 53.5 × 36, 48 × 35.5, 49.5 × 36, 49.5 × 34.7, 53 × 35, 48.6 × 33, 52 × 34.7, 49 × 33.2, 48.2 × 34.5, 54.5 × 35, 49 × 36, 49.5 × 35, 50 × 35 mm. The eggs were found on the so-called Bird-Rocks on July 29th and August 9th, 1912.

Breeding-season. July and August.

HEMIPUFFINUS CARNEIPES.

(HULLIANUS.)

FLESHY-FOOTED PETREL.

HEMIPUFFINUS Iredale, Austral. Av. Rec., Vol. II., p. 20, August 2nd, 1913. Type (by monotypy): *Puffinus carneipes* Gould.

PUFFINUS CARNEIPES Gould, Ann. and Mag. Nat. Hist., Vol. XIII., p. 365, May 1st, 1844: near Cape Leeuwin, West Australia (fig. Gould Austr. VII., pl. 57; Mathews, Vol. II., pl. 76).

Puffinus carneipes hullianus Mathews, Birds Austr., Vol. II., p. 90, May 30th, 1912: Norfolk Island error=Lord Howe Island.

Hemipuffinus carneipes hullianus Mathews, List Birds Austr., p. 319, Dec. 1912; *id.*, Syst. Av. Australas., p. 114, 1927.

DISTRIBUTION. Lord Howe Island (breeding).

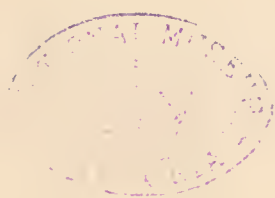
Adult male. Crown of head, occiput, nape, hind-neck and fore-head dark smoky-brown, slightly tinged with grey, with the basal two-thirds of the feathers whitish-grey; scapulars, lower back and rump smoky-brown, slightly margined with lighter brown; upper tail-coverts uniform smoky-brown; quills uniform blackish-brown; tail-feathers brownish-black; sides of face, ear-coverts, cheeks, chin and throat brown, strongly washed with slate-grey; sides of neck, fore-neck and remainder of the under-surface of the body uniform dusky-brown, with the bases of the feathers only a trifle lighter in colour; under wing-coverts and axillaries blackish-brown; under aspect of quills brownish-grey. Bill light flesh-brown, eyes dark brown, feet almost white. Total length 520 mm.: culmen 45, wing 318, tail 107, tarsus 53. Collected on Middle Beach, Lord Howe Island, on the 21st of January, 1914.

Sexes. Alike.

Nest. At the end of a burrow.

Eggs. Many eggs were found on Lord Howe Island from December 8th to 16th, 1913. Birds of the year with large patches of down were found on April 27th and May 1st. They are like eggs of other *Puffinus* but larger, and measure: 75 × 47, 71 × 46·5, 68 × 42·7, 67·8 × 46·6, 67 × 45, 73·8 × 46·5, 70 × 47·5, 74·5 × 44, 69 × 44·7, 68·5 × 48, 66 × 47, 70 × 47·5, 69 × 40·5, 73·5 × 46·5, 74 × 46, 70 × 47·2, 68·5 × 46, 70 × 48, 70 × 46·2, 67 × 49, 66·7 × 45, 70 × 46·2, 70 × 48·7, 69 × 43·5, 67·5 × 47·5, 62·7 × 47, 65·5 × 44, 70·5 × 48·2, 72·5 × 48, 72 × 46, 71 × 44, 70 × 46·5, 72·5 × 44·4, 70 × 48, 71 × 42·5, 69·5 × 47, 62 × 42, 63 × 47 mm.

Breeding-season. December.





H. Grönvold, del.

PTERODRONA NEGLECTA
(*CEMANEC PTERILL*)

Witherby & Co

PTERODROMA NEGLECTA.

KERMADEC PETREL.

(PLATE 11.)

PTERODROMA Bonaparte, Comptes Rendus Acad. Sci. (Paris), Vol. XLII., p. 768, May 1856.
Type (by subsequent designation, Coues, Proc. Acad. Nat. Sci. Philad., p. 137, 1866):
Procellaria macroptera Smith.

PROCELLARIA NEGLECTA Schlegel, Mus. Pays-Bas, Vol. VI., Proc.ell., p. 10, July 1863: Kermadec Islands.

Procellaria neglecta Schlegel, Mus. Pays-Bas, Vol. VI., Proc.ell., p. 10, July 1863.

Æstrelata neglecta Salvin, Cat. Birds Brit. Mus., Vol. XXV., p. 412, 1896 (pref. July 30th, 1895);
Mathews, Handl. Birds Austr., p. 17, Jan. 1908; Godman, Monograph Petrels, p. 226,
pl. 64, pt. iii., Sept. 1908.

Æstrelata leucophrys Hutton, Proc. Zool. Soc. (Lond.), 1893, p. 752, pl. 63, April 1st, 1894: Sunday Island, Kermadec Islands.

Rhantistes raoulensis Salvin, Cat. Birds Brit. Mus., Vol. XXV., p. 412, 1896 (early), (pref. July 30th, 1895) as synonym of *Æstrelata neglecta* (ex *R. raoulensis* [sic] Bonaparte, Comptes Rendus Acad. Sci. (Paris), Vol. XLII., p. 210, April 28th, 1856, ex Gould MS.).

Pterodroma neglecta Mathews, Birds Austr., Vol. II., p. 168, July 31st, 1912; Mathews and Iredale, Austral Av. Rec., Vol. IV., p. 109, Dec. 16th, 1920; Mathews, Syst. Av. Australas., p. 119, 1927.

Pterodroma neglecta quintali Mathews, Austral Av. Rec., Vol. III., pt. 3, p. 68, April 7th, 1916: Lord Howe Island.

Pterodroma neglecta neglecta Mathews, *ib.*

DISTRIBUTION. Kermadec Islands (breeding), Lord Howe Island (breeding), Rapa Island, Austral. Group. Juan Fernandez.

Adult (light form). General colour above brownish-ash; crown of the head, occiput, nape, hind-neck, fore-head, lores, eyebrow, sides of the face, ear-coverts and cheeks, ash-brown, each feather white at the base; scapulars, lower back, rump, upper tail-coverts, lesser, median and greater wing-coverts dark brownish-ash, with the basal half of each feather white; primary quills blackish-brown on the outer web, inner web white, becoming ash-brown towards the shafts and on the terminal third of each feather; tail-feathers blackish-brown, white at the base; chin, throat and remainder of the under-surface light greyish-brown on the terminal half and white on the basal half; under wing-coverts and axillaries dark brownish-ash. Bill black, eyes very dark brown, feet black and dark grey. Total length 440 mm.: culmen 29, wing 295, tail 105, tarsus 29. Figured. Collected on Mount Gower, Lord Howe Island.

Adult female (dark form). Crown of the head, occiput, nape, hind-neck and fore-head light ash-brown, fringed with whitish and with the basal two-thirds pure white; sides of the face, ear-coverts, cheeks, chin and throat white; lower back, rump, upper tail-coverts, lesser,

KERMADEC PETREL.

greater and median wing-coverts dark brownish-ash with the basal two-thirds of each feather white; sides of the face, fore-neck and chest white, faintly fringed at the tips with dusky; abdomen, sides of the body, flanks and thighs white, strongly tinged with rose-colour; under tail-coverts with the basal half rosy-white, and the terminal half blackish-brown, with whitish tips; axillaries blackish-brown, slightly fringed with greyish-white. Bill black, eyes dark brown, feet black and very light grey. Figured. Collected on Mount Gower, Lord Howe Island.

Nest. A large structure, placed above ground.

Egg. Clutch one, pure white with roughish surface. Measurements: 60.1×46 , 64×46 , 66×46 mm.

Breeding-season. October, November and December.

"I gather that this bird breeds only on Sunday Island, one of the Kermadec group. Unlike some other Petrels, it makes its nest on the surface of the ground. It sometimes sits under fallen logs but always in the light or even in the sunshine.

"It arrives on Sunday Island in August, nest building in September, when they leave the island for a month. The nest is a very large structure and, after a month's absence, becomes untidy; after the necessary remaking the bird lays its egg towards the end of October, and incubation takes about six weeks.

"The young are tended till they are fully grown, they are then fat. The old birds leave them and they live on their own fat till hunger compels them to fly to sea. From the time the parents leave them until they are able to fly the down is lost and the young are fully feathered. The young leave Sunday Island towards the end of March, April, or even the middle of May."

I WENT through the dark phase of *neglecta* with Dr. Hartert in the Tring Museum, but we could find no specimen with a mottled forehead; many had mottling in front of the eyes. This prevents *melanopus* from being used for *neglecta*. In the description of the bird by Latham, he says "legs very pale, the webs for one-third the same, the rest to the end black." In the plate of *montana* (I figure the type of *montata* not *solandri*) I show the tarsus and webs at the junction of a light colour. This is the colour of these parts as given on the label. So that this does not prevent the use of *melanopus* for the Lord Howe bird. The mottling of the feathers *all* round the bill is diagnostic, and the name *melanopus* applies *only* to this bird.

That a large number of birds from Lord Howe Island are said to have black feet is a fact; but some also have pale legs with the basal third also pale.

The facts as shown in the next article are new, and explain that the bird's original home was Norfolk.





PTERODROMA MALANOPUS
(Reproduced from Raper's Drawing.)

PTERODROMA MELANOPUS.

BROWN-HEADED PETREL.

(PLATE 12.)

PROCELLARIA MELANOPUS Gmelin, Syst. Nat., Vol. I., pt. II., p. 562, April 20th, 1789 : North America error=Norfolk Island.

Procellaria melanopus Gmelin, Syst. Nat., Vol. I., pt. II., p. 562, April 20th, 1789 : Norfolk Island.

Procellaria solandri Gould, Ann. and Mag. Nat. Hist., Vol. XIII., p. 363, May 1st, 1844 : Bass Straits.

Procellaria philippii Gray, Ibis, July 1862, p. 246 : Norfolk Island.

Procellaria agilis Gray, Handl. Gen. Spec. Birds B.M., pt. III., p. 106, Aug. 18th, 1871 ; as synonym of *philippii* Gray.

Æstrelata solandri Salvin, Cat. Birds Brit. Mus., Vol. XXV., p. 410, 1896 (pref. July 30th, 1895) ; Godman, Monogr. Petrels, p. 219, 1908.

Æstrelata montana Hall, Proc. Linn Soc. (N.S.W.), Vol. XXXV., p. 785, March 1st, 1911 : Lord Howe Island.

Pterodroma melanopus Mathews, Birds Austr., Vol. II., pt. II., p. 141, pl. 84, July 31st, 1912 ; Mathews and Iredale, Austral. Av. Rec., Vol. IV., p. 108, Dec. 16th, 1920 ; *id.*, Man. Birds Austr., p. 34, March 9th, 1921 ; Mathews, Syst. Av. Australas., p. 118, 1927 ; Hartert, Nov. Zool., Vol. XXXIV., pp. 129-131, 1928.

DISTRIBUTION. Australia, Lord Howe Island (formerly Norfolk Island).

Adult. Back, scapulars, and upper tail-coverts slate-grey with dark edges to the feathers ; lesser wing-coverts, bastard-wing, and primary-coverts dark brown ; primary-quills also dark brown on the outer webs and at the tips, paler on the inner webs, and becoming white at the base ; median and greater coverts slate-grey, the secondaries similar but pale brown on the inner webs and whitish at the base ; tail dark brown with hoary-grey on some of the outer webs of the feathers, pale on the inner webs and also at the base ; head and neck all round sooty-brown, the feathers having white bases give a scalloped appearance on the fore-head and sides of the face ; breast pale sooty-brown, becoming dull slate-grey on the abdomen, under tail-coverts and sides of the body ; the feathers on the side of the body slightly edged with white at the tips like the axillaries ; under wing-coverts dark brown, the greater under wing-coverts dull white like the base of the primaries. Bill black ; eyes dark brown ; feet black, webs greyish-black. Total length 450 mm. : exposed culmen 40, wing 296, tail 128, tarsus 41. (Type of *solandri* Gould.)

Sexes. Alike.

Adult female. Forehead and lores smoky-black, each feather broadly margined with white ; crown of the head, occiput, nape and hind-neck smoky-black, with the basal half of the feathers whitish-grey ; scapulars, lower back, rump and upper tail-coverts dark slaty-grey, each feather margined with blackish-brown, producing a sealed appearance ; wing-coverts brownish-black, slightly fringed with whitish at the extremity ; quills brownish-black, becoming greyish-white towards the inner margin ; tail-feathers brownish-black,

BROWN-HEADED PETREL.

powdered with slate-grey; sides of the face, ear-coverts, cheeks, chin and throat greyish-brown, each feather margined with white; remainder of the under-surface of the body smoky-brown with the concealed basal two-thirds white; under tail-coverts smoky-grey; under wing-coverts and axillaries brownish-black. Bill black, eyes dark brown, feet black. Total length 445 mm.: culmen 33, wing 296, tail 135, tarsus 40. Collected on the Lower Road, Lord Howe Island, on the 21st of April, 1914.

Immature. Like the adult, but the secondary wing-coverts lighter, median coverts darker, lesser wing-coverts lighter. The dark tips to the feathers of the under-surface are somewhat paler.

Nestling. Covered with dark ashy-grey down, concolour.

Nest. A large accumulation of grass placed at the end of a burrow; some burrows are six feet in length, in which the egg is almost concealed.

Egg. Clutch one; dull white, 63 mm. by 44.

Breeding-season. May and June to August.

Eggs. The "Mountain Petrel" was found breeding on Mt. Gower on Lord Howe Island on the 30th of May, 1914, and 15 eggs were taken. The eggs are ovate to rounded ovate, very little pointed, much less elongated and thicker than the eggs of the *Puffini*. They are pure white, smooth, but glossless and irregularly pitted. Held against the light they have a faint creamy tinge. They measure: 69.5×49.5 , 68×50 , 68.5×50.5 , 66×47.8 , 73×49.5 , 66×49.5 , 68.5×48.5 , 64.5×49 , 64×48 , 62.5×48.5 , 63×48.5 , 63×50 , 65.5×50 , 67.5×49 , and 66×50 mm. (These eggs were found in burrows, while *Pterodroma neglecta* lays its eggs in the open. This is well known, and Roy Bell's labels confirm it.)

IN my *Birds of Australia*, as given above, pp. 148-9, I suggested that the persistent persecution by the early colonists forced this bird to abandon Norfolk Island, its original home, and take refuge on Lord Howe Island. Hunter says: "They were at the end of May as plentiful as if none had been caught, although for two months before there had not been less taken than from two to three thousand birds every night." After Hunter was wrecked in the "Sirius" on Norfolk Island, in March, 1790, he and his men lived on these birds for some time. There were over 500 people to feed.

I fortunately possess a painting of this bird done by George Raper in 1790, from a bird taken at Mount Pitt, Norfolk Island, the Bird of Providence of Hunter, *Procellaria providentia*=*Pterodroma providentia*, of which name the plate is the type.

LEUCANOUS ALBUS.

(ROYANUS.)

WHITE TERN.

LEUCANOUS Mathews, Birds Austr., Vol. II., pt. iv., p. 432, Nov. 1st, 1912. Type (by original designation): *Gygis microrhynchus* Saunders.

Gygis Wagler, Isis, Nov. 1832, heft. XI., col. 1223. Type (by monotypy): *Sterna candida* Gmelin. Not *Gyges* Bory St. Vincent, Ency. Méth., p. 449, 1825.

Alphagyis Mathews, Austral. Av. Rec., Vol. II., pt. v., p. 110, Sept. 24th, 1914, new name for *Gygis* Wagler.

STERNA ALBA Sparrman, Mus. Carlson., fasc. 1, No. ii., 1786: restricted to Ascension Island.

Gygis alba royana Mathews, Birds Austr., Vol. II., pt. iv., p. 433, pl. 119, Nov. 1st, 1912: Kermadec Island; *id.*, List Birds Austr., p. 51, Dec. 1913.

Gygis candida Gould, Birds Austr., pt. xxxv., Vol. VII., pl. 30, Dec. 1st, 1848; *id.*, Handb. Birds Austr., Vol. II., p. 405, Dec. 1865; Saunders, Cat. Birds Brit. Mus., Vol. XXV., p. 149, 1896 (pref. Nov. 3rd, 1895).

Gygis alba Hartert, Nov. Zool., Vol. V., p. 67, 1898; Mathews, Handb. Birds Austral., p. 22, Jan. 1908.

Gygis alba candida Mathews, Nov. Zool., Vol. XVIII., p. 211, Jan. 1912.

Leucanous albus Mathews and Iredale, Austral. Av. Rec., Vol. IV., p. 110, Dec. 16th, 1920; *id.*, Manual Birds Austr., p. 105, March 9th, 1921.

Leucanous albus royanus Mathews, Syst. Av. Australas., p. 142, 1927.

DISTRIBUTION. Norfolk Island: Kermadec Island, East coast of Australia?

Adult male. Entirely ivory-white; short feathers surrounding the eye black; shaft-lines of primary-quills dark brown, somewhat darker and inclining to black on the shafts of the tail-feathers; bill black at tip, base blue; iris brown; tarsus, toes and webs yellow. Total length 330 mm.: culmen 45, wing 250, tail 110, tarsus 16.

Adult female. Similar but smaller.

Immature (half grown). Down mottled, not uniform; a large black patch above and extending behind the eye; pale brown line above, and then black markings towards the nape; greyish-brown on the fore-head with lighter edge; back dark brownish-grey with indistinct pale blotches; wings similar; throat dark grey, abdomen lighter; iris very dark brownish-grey, feet light blue, webs flesh-colour, bill bluish-black all over.

Nestling. Covered with black down. Also varying from dark brownish-grey to very light grey or almost white.

Nest. The egg is laid in a depression on the branch of a tree or on a point of rock.

Eggs. Clutch one; ground-colour stone, blotched all over with reddish-brown and lavender. Some examples have a resemblance to the eggs of *Chlamydera*. Dimensions 44-42 mm. by 33.

Breeding-season. October to February.

Eggs. Many eggs were found on Norfolk Island on the 4th of February, 1913, 18th of November, 1912, 3rd of January, 1912, 9th of January, 1913, 6th of February, 1913, and 30th of October, 1912. The well-known eggs have often been described and figured, and vary very much. Those from Norfolk Island measure: 44.5×31.3 , 45.5×31.5 , 42×32 to 47.5×32.5 , 48.5×30.8 , 50.3×33.6 mm.

PROCELSTERNA CERULEA.

(ALBIVITTA).

GREY NODDY.

PROCELSTERNA Lafresnaye, Mag. de Zool., 1842, pl. 29 (dated March). Type (by monotypy):
Procellsterna tereticollis Lafresnaye=a subspecies of *Sterna cerulea* Bennett.

STERNA CERULEA Bennett, Narr. Whaling Voy., Vol. II., p. 248, (pref. April 14th) 1840: Christmas Island, Pacific Ocean.

Procellsterna albivitta Bonaparte, Comptes Rendus, Acad. Sci. (Paris), Vol. XLII., p. 773, May 1856: Lord Howe Island. New name for *Anous cinereus* Gould, not Haldeman; Gould, Handb. Birds Austr., Vol. II., p. 420, Dec. 1865.

Anous cinereus Gould, Proc. Zool. Soc. (Lond), 1845, p. 104, Feb. 1846: Lord Howe Island. Not Haldeman, Zoological Contr., pt. 2, No. 8, Dec. 1843; *id.*, Birds Austr., pt xxxv., Vol. VII., pl. 37, Dec. 1st, 1848.

Procellsterna cinerea Saunders, Cat. Birds Brit. Mus., Vol. XXV., p. 135, 1896 (pref. Nov. 3rd, 1895); Mathews and Iredale, Austral Av. Rec., Vol. IV., pp. 109-110, Dec. 16th, 1920; *id.*, Manual Birds Austr., p. 103, March 9th, 1921.

Procellsterna cerulea cinerea Mathews, Nov. Zool., Vol. XVIII., p. 210, Jan. 1912; *id.*, Birds Austr., Vol. II., pt. iv., p. 426, pl. 118, Nov. 1st, 1912; *id.*, List Birds Austr., p. 50, Dec. 1913.

Procellsterna cerulea kermadeci Mathews, Austral Av. Rec., Vol. III., p. 55, April 7th, 1916: Kermadec Island.

Procellsterna cerulea albivitta Mathews, Syst. Av. Australas., p. 144, June 13th, 1927.

DISTRIBUTION. Lord Howe and Norfolk Islands; East Australia; Kermadec Islands.

Adult male. General colour above ash-grey, paler and inclining to white on the head, sides of face and entire under-surface of body, including the under wing-coverts; under tail-coverts ash-grey like the upper-surface; inner webs of outer primary quills inclining to black near the shaft, the innermost portion becoming whitish; most of the secondaries grey, margined with white at the tips; short feathers encircling the eye, black in front and white on the hinder portion. Bill black, iris blackish-blue, tarsi and toes black, webs lemon-yellow. Total length 279 mm.: culmen 29, wing 207, tail 120, tarsus 24.

Adult female. Similar to the male but smaller.

Immature. Differs from the adult in being dark slate-grey both above and below, the wings being somewhat darker than the back; primary quills inclining to black.

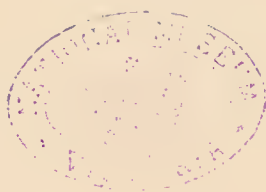
Nestling. Almost the same colour as the parent bird.

Nest. None made, the egg is laid on the bare rock or sand.

Egg. Clutch one; ground-colour stone, with underlying spots of grey sparingly distributed, and fewer spots of chestnut-brown. Dimensions 42 mm. by 30.

Breeding-season. September to January (Norfolk Island).

Eggs. Two eggs were taken on Phillip Island on the 8th of November, 1912. The eggs of *Procellsterna* differ widely from the eggs of *Anous* and the *sternæ*. They are glossless, pale, brownish-cream or cream colour and have a few pale rufous and pale purplish-grey spots all over the egg, none very large. The two eggs from Phillip Island measure: 41.2 × 29.2 and 41.6 × 30.3 mm.





H. Grönvold, del.

Witherby & Co

SPILOGLAUX ALBARIA
(LORD HOWE ISLAND OWL.)

Order STRIGIFORMES.

No. 15.

Family STRIGIDÆ.

SPILOGLAUX NOVÆSEELANDIÆ.
(ALBARIA).

LORD HOWE ISLAND OWL.

(PLATE 13.)

SPILOGLAUX Kaup, Isis, Oct. 1848, heft 10, col. 768. Type (by subsequent designation, Gray, 1855, p. 8): *Strix boobook* Latham.

STRIX NOVÆSEELANDIÆ Gmelin, Syst. Nat., Vol. I., pt. 1, p. 296, July 25th, 1788: Queen Charlotte's Sound, South Island, New Zealand.

Ninox albaria Ramsay, Tab. List Birds Austr., p. 37, 1888 (before Dec.): Lord Howe Island; *id.*, Cat. Austr. Birds, Striges, p. 25, 1890; 2nd edn., p. 29, 1898; Mathews, Handl. Birds Austr., p. 43, Jan. 1908.

Ninox boobook albaria Mathews, Nov. Zool., Vol. XVIII., p. 447, Jan. 1912.

Spiloglaux boobook albaria Mathews, List Birds Austr., p. 320, Dec. 1913.

Spiloglaux novæseelandiæ albaria Mathews, Birds Austr., Vol. V., pt. iii., p. 332, May 23rd, 1916; *id.*, Syst. Av. Australas., p. 272, 1927.

DISTRIBUTION. Lord Howe Island.

Adult female. General colour above dull reddish earth-brown, faintly powdered with grey; lower back, rump, upper tail-coverts, lesser, median and greater wing-coverts dull reddish-chestnut, each feather with large twin spots or bars of white; primary quills hair-brown, each feather with wide equidistant bars of greyish-buff on the inner web and bright buff on the outer webs; tail-feathers hair-brown, with indistinct bars of brownish-buff; crown of head, occiput, nape, hind-neck, fore-head, lores and a narrow eyebrow, white; sides of the face, cheeks, chin and upper throat white; lower throat pale buff; fore-neck, chest, breast, abdomen, sides of the body and flanks rich reddish-brown, each feather with a twin spot of white near the tip and basally barred with white; thighs rich buff; under tail-coverts white, tipped with buff and with a large spot of white towards the extremity; under wing-coverts similar to the breast; axillaries white, barred with reddish-brown; quills below hair-brown, barred with creamy-white. Bill blue-black and green, eyes bright yellow, feet greenish-yellow. Total length 355 mm.: culmen 24, wing 216, tail 134, tarsus 35. Figured. Collected on Lord Howe Island,

Adult male. Similar to the above. Total length 345 mm.: culmen 22, wing 214, tail 133, tarsus 38. Collected at the Pines, Lord Howe Island, on the 13th of October, 1913.

Immature. Birds seem more spotted on the back.

Nest. A hole in a tree.

Eggs. Clutch probably similar to its allies.

Order STRIGIFORMES.

No. 16.

Family STRIGIDÆ.

SPILOGLAUX NOVÆSEELANDIÆ.

(ROYANA.)

NORFOLK ISLAND OWL.

(PLATE 14.)

NINOX BOOBOOK ROYANA Mathews, Austral. Av. Rec., Vol. I., p. 120, Dec. 24th, 1912: Norfolk Island.

Ninox boobook royana Mathews, Austral. Av. Rec., Vol. I., p. 120, Dec. 24th, 1912; *id.*, List Birds Austral., p. 320, Dec. 1913.

Spiloglaux novæseelandiæ royana Mathews, Birds Austr., Vol. V., pt. iii., p. 333, May 23rd, 1916; *id.*, Syst. Av. Australas., p. 272, 1927.

DISTRIBUTION. Norfolk Island.

Adult female. Feathers of the fore-head white at the base, tipped with chocolate-brown and with narrow black shafts; head, neck and ear-coverts uniform dark brown with a powdered appearance; mantle and lower back dull chocolate-brown; scapulars and rump of the same colour as the back, barred with dull white; primaries, secondaries and tail dull earth-brown, obscurely barred with brownish-buff; feathers at the base of the bill black, long and bristle-like; lores and chin white; breast, chest, belly, sides and flanks rich chocolate-brown, spotted and barred with white; belly and flanks more strongly barred, some of the feathers having twin spots of white; under tail-coverts rich buffish-white, with a large spot of chocolate-brown towards the extremity; under wing-coverts rich brownish-buff, indistinctly barred with brown. Eyes bright brass-yellow, bill dark blue-grey, feet bright yellow. Total length 310 mm.: wing 200, tail 127, tarsus 33, culmen 22. Figured. Collected near the Cable Station, Norfolk Island, on the 17th of March, 1913.

Adult male. Similar to the adult female. Total length 300 mm.: wing 201, tail 123, tarsus 32, culmen 20. Collected at Red Road, Mt. Pitt, Norfolk Island, on the 25th of September, 1912, and is the type of *Ninox boobook royana*.

Nest. A hole in a tree.

Eggs. Clutch probably similar to its allies.



Roland Green, del.

Witherby & Co.

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SPILOGLAUX ROYANA.
(NORFOLK ISLAND OWL).



H. Gronvold, del.

Witherby & Co

NESTOR PRODUCTUS
(LONG-BILLED PARROT)

NESTOR PRODUCTUS.

LONG-BILLED PARROT.

(PLATE 15.)

NESTOR Lesson, Traite d'Ornith., p. 190, livr. iii., p. 190, July 10th, 1830. Type (by monotypy) :

Psittacus meridionalis Gmelin.

Centrurus Swainson, Class. Birds, Vol. II., p. 303, July 1st, 1837. Type (by monotypy) : *Psittacus*

australis Shaw=*P. meridionalis* Gmelin.

PLYCTOLOPHUS PRODUCTUS Gould, Proc. Zool. Soc. (Lond.), May 24th, 1836, p. 19 : Phillip Island, off Norfolk Island.

(?) Wilson's Parrakeet Latham, Gen. Hist. Birds, Vol. II., p. 170, 1822 : New South Wales error= Norfolk Island.

Long-billed Parrakeet Latham, *ib.*, p. 171 : Norfolk Island=(*productus*).

Plyctolophus productus Gould, Proc. Zool. Soc. (Lond.), May 24th, 1836, p. 19.

Nestor productus Gould, Synopsis Birds Austr. and Adj. Islands, pt. 1., pl. 12, Jan. 1837 ; *id.*, Birds Austr. and Adj. Islands, part 1, pl. 7, Aug. 1837 ; *id.*, Birds Austr., Vol. V., pl. 6 (pt. 5), Dec. 1st, 1841 ; Pelzeln, Sitzungs. Ak. der Wiss., Vol. XLI., p. 323, pl. 5, figs. 3, 4, 5, 1860 (after June 8th) ; Gould, Handb. Birds Austr., Vol. II., p. 550, Dec. 1865 ; Salvadori, Cat. Birds Brit. Mus., Vol. XX., p. 9, 1891 (pref. Dec. 13th) ; Rothschild, Extinct Birds, p. 45, pl. 6 (head), 1907 (before June 19th) ; Mathews, Handl. Birds Austral., p. 44, Jan. 1908 ; *id.*, Nov. Zool., Vol. XVIII., p. 452, Jan. 1912 ; *id.*, List Birds Austr., p. 326, Dec. 1913 ; Mathews and Iredale, Austral Av. Rec., Vol. IV., p. 110, Dec. 16th, 1920 ; Mathews, Syst. Av. Australas., p. 282, 1927.

Centrurus productus Bonaparte, Papagaïen, No. 265, Naumannia, 1856.

Nestor norfolcensis Pelzeln, Sitzungs. Ak. der Wiss., Vol. XLI., p. 322, pl. 5, fig. 1, 1860 (after June 8th) : Norfolk Island ; Salvadori, Cat. Birds Brit. Mus., Vol. XX., p. 10, 1891 (pref. Dec. 31st) ; Forbes and Robinson, Bull. Liverpool Mus., Vol. I., No. 1, p. 5, pl. 1, Aug. 1897 ; Rothschild, Extinct Birds, p. 47, pl. 6, 1907 (before June 19th) ; Mathews, Handl. Birds Austral., p. 44, Jan. 1908.

DISTRIBUTION. Phillip Island, Norfolk Island (extinct).

Adult. Top of the head grey, each feather bordered with smoky-brown ; nape and hind-neck grey, tinted with dull golden-yellow, each feather margined with dull blackish-brown, producing a waved appearance ; mantle and scapulars dull brownish-grey, each feather widely margined with blackish-brown ; feathers of the lower back and rump dull crimson, narrowly margined with brown ; lesser wing-coverts like the mantle ; median and greater coverts greenish-grey, margined with brown and with a sub-marginal band of golden-yellow ; primary-coverts dark grey, glossed, especially on the outer web, with dull olive-green ; quills umber-brown, glossed on the outer web with dull bluish-green ; tail-feathers umber-brown, glossed on the outer webs with dull olive-green ; sides of the face, ear-coverts and cheeks orange-red with white shafts to all the feathers ; chin devoid of feathers ; throat dull vinous with whitish shafts ; sides of neck, fore-neck, chest and upper breast vinous-grey with a narrow margin of blackish-buff and a submarginal band of golden olive-yellow ; lower breast yellowish-white bordered with orange-yellow ; abdomen, sides of the body, flanks and under tail-coverts olive-brown, tinged with red ; lesser under wing-coverts golden-yellow ; median under wing-coverts and axillaries crimson-red ; primary-quills and under-surface of the tail, ash-brown on the terminal half, with the basal half reddish-white, barred with ash-brown. Total length about 380 mm. : culmen 54, wing 255, tail 138, tarsus 36 (Brit. Mus.).

LONG-BILLED PARROT.

Adult. Back and scapulars whitish-grey, each feather margined with brownish-black, producing a scaled appearance; rump and upper tail-coverts crimson-red, narrowly margined with dull brown; primaries above blackish-brown, beneath glossy blackish-brown at the extremity, with the basal half golden peach-colour, barred with dull grey; upper-surface of the tail blackish-brown glossed with dull olive-green; under-surface of the tail blackish-brown, toothed on the inner web towards the basal half with vinous-red; feathers on the sides of the head long and pointed and of a dull carmine; cheeks golden-yellow; chin devoid of feathers; sides of neck, fore-neck, chest and breast vinous-grey, each feather margined with greyish-black and with a submarginal band of golden-yellow; upper breast dull golden-white; abdomen, sides of the body, flanks, thighs and under tail-coverts carmine faintly tipped with yellow. Total length about 380 mm.: culmen 44, wing 253, tail 143, tarsus 35 (Brit. Mus. B.).

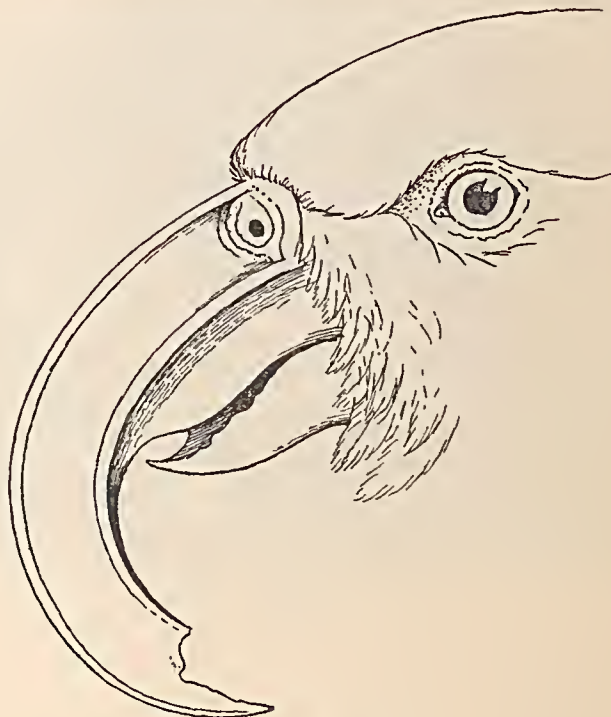
Adult. Similar to the above, but the under-surface of the tail reddish-buff on the basal two-thirds with obscure bars of brownish-grey and the terminal portion greyish-brown; the feathers of the face pointed and of a dull carmine. Total length about 370 mm.: culmen 53, wing 256, tail 136, tarsus 36. Figured (large figure).

Immature. Scapulars and upper back dull brownish-grey, each feather broadly margined with dull black; lower back and rump dull crimson-red; lesser, greater and median wing-coverts greyish-brown, the median-coverts tipped with yellowish-white; primary-quills above blackish-brown, slightly glossy below, blackish-brown on the terminal half, the basal half being rich apricot-colour broadly toothed with greyish-brown; upper-surface of the tail uniform blackish-brown, under-surface blackish-brown on the terminal half and with the basal half margined on the inner web with vinous-pink (not toothed as in the adult); cheeks reddish-brown; chin naked; throat golden-orange with the shafts whitish; fore-neck dark grey, bordered with golden-yellow; chest and breast golden-yellow; abdomen, sides of the body, flanks, thighs and under tail-coverts dull carmine; under wing-coverts and axillaries golden-yellow, brighter towards the inner margin. Total length about 375 mm.: culmen damaged (43), wing 252, tail 132, tarsus 34. Figured (small figure).

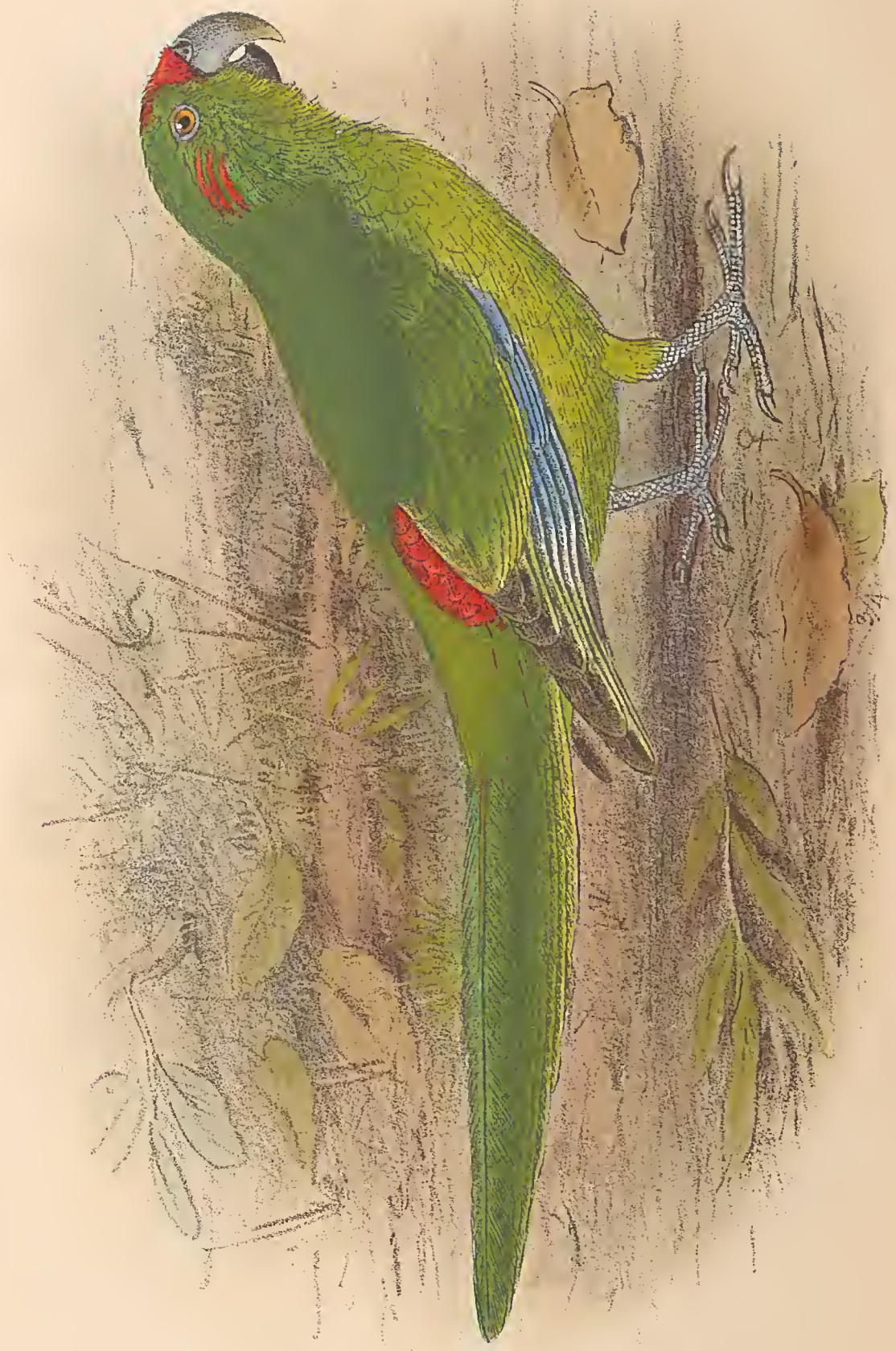
This bird, from the Liverpool Museum, is supposed to be *norfolcensis* of Pelzeln, who described it, on account of its extraordinary bill. This and the next were kindly lent me for comparison by Dr. Simpson of the above Museum. They are from the collection of the late Canon H. B. Tristram.

Another skin is similar to the above, but the under-surface of the tail is blackish-brown, toothed on the inner web, towards the basal half, with reddish-pink. Culmen 51 mm., wing 259, tail 149, tarsus 35.

I HAVE had a drawing made from Pelzeln's figure to show the formation of the bill.







H. Gronvold, del.

CYANORHAMPHUS SUBFLAVESCENS
(LORD HOWE ISLAND GREEN PARROT)

Witherby & Co

Order PSITTACIFORMES.

No. 18.

Family PLATYCERCIDÆ.

CYANORAMPHUS NOVÆZELANDIÆ.

(SUBFLAVESCENS.)

LORD HOWE ISLAND GREEN PARROT.

(PLATE 16.)

CYANORAMPHUS Bonaparte, Rev. and Mag. de Zool., Vol. VI., p. 153, March 1854. Type (by subsequent designation Gray, 1855, p. 86) : *Psittacus pacificus* Forster = *Psittacus erythrotis* Kuhl.

PSITTACUS NOVÆZELANDIÆ Sparrman, Mus. Carlson, fasc. ii., No. XXVIII., 1787 : Dusky Sound, New Zealand.

Cyanoramphus subflavescens Salvadori, Ann. Mag. Nat. Hist., Ser. vi., Vol. VII., p. 68, 1891 : Lord Howe Island ; *id.*, Cat. Birds Brit. Mus., Vol. XX., p. 585, pl. xvii., 1891 (pref. Dec. 13th) ; Rothschild, Extinct Birds, p. 70, 1907 (before June 19th) ; Mathews, Handl. Birds Austral., p. 51, Jan. 1908.

Platycercus novæzelandiæ subflavescens Mathews, Nov. Zool., Vol. XVIII., p. 452, Jan. 1912.

Cyanoramphus novæzelandiæ subflavescens Mathews, List Birds Austr., p. 326, Dec. 1913 ; *id.*, Syst. Av. Australas., p. 349, June 13th, 1927.

DISTRIBUTION. Lord Howe Island (extinct) ; two skins in British Museum.

Adult female (type). Fore-head and fore-part of the crown crimson-scarlet ; lores, sides of the face, ear-coverts and cheeks bright grass-green ; a patch of dull crimson behind the eyes ; chin and throat devoid of feathers ; sides of the neck and entire under-parts bright yellowish-green, lightest on the abdomen ; under wing-coverts and axillaries greenish-blue ; quills below brownish-ash, narrowly barred on the inner web with yellow ; scapulars, mantle, lower back and rump grass-green ; a patch of dull crimson on each side of the rump ; upper tail-coverts slightly paler than the back ; primary-quills dark ash-brown with the outer webs blue on the basal half and bright grass-green on the terminal half and narrowly bordered with golden-yellow ; tail-feathers dark green bordered on the outer web with golden-yellow ; shafts horn-brown. Total length 325 mm. : culmen 22, wing 149, tail 162, tarsus 22. Collected on Lord Howe Island on the 7th of September, 1853.

Adult male. Similar to the adult female, but the upper- and under-parts are a little brighter. Total length 232 mm. : culmen 19, wing 141, tail 144, tarsus 21. Collected at the same time and place as the female.

Nest and eggs not described.

**Platycercus pennantii* var. *nobbsi* Tristram, Ibis, Jan. 1885, p. 49 : Norfolk Island.

In my *Birds of Australia*, Vol. IV., pt. 4, p. 316, June 27th, 1917, I considered this bird to be introduced to Norfolk Island. The eggs are :—A clutch of 4 was found on 23rd November, 1912, and one of 5 eggs on 1st November, 1912. The eggs are without gloss or with faint gloss. Measures : 28.5 × 23.4, 27.6 × 23.6, 29 × 23.5, 27.6 × 24 ; 29 × 22.5, 28.5 × 23.5, 28.3 × 23.5, 28 × 23.1, 29.6 × 22.1 mm.

CYANORAMPHUS NOVÆZELANDIÆ.

(VERTICALIS.)

NORFOLK ISLAND GREEN PARROT.

(PLATE 17.)

PSITTACUS VERTICALIS Latham, Index Ornith. Suppl., p. xxii., No. 9, 1801, after May 30th : New Holland error=Norfolk Island.

Red-topped Parrot Latham, General Synops., Suppl. II., p. 369, 1801 : Port Jackson error=Norfolk Island.

Psittacus verticalis Latham, Index Ornith. Suppl., p. xxiii, 1801, after May 30th : Norfolk Island ; Salvadori, Cat. Birds Brit. Mus., Vol. XX., p. 606, 1891 (pref. Dec. 13th).

Platycercus cookii Gray, List Sp. Birds Brit. Mus., pt. iv., sec. ii., p. 13, May 28th, 1859 : New Zealand error=Norfolk Island.

Platycercus rayneri Gray, Ibis, July 1862, p. 228 : Norfolk Island.

Cyanoramphus cooki Salvadori, Cat. Birds Brit. Mus., Vol. XX., p. 584, 1891 (pref. Dec. 13th) ; Mathews, Handl. Birds Austral., p. 51, Jan. 1908.

Platycercus novæzelandiæ verticalis Mathews, Nov. Zool., Vol. XVIII., p. 447, Jan. 1912.

Cyanoramphus novæzelandiæ verticalis Mathews, List Birds Austr., p. 320, Dec. 1913 ; *id.*, Syst. Av. Australas., p. 349, June 13th, 1927.

DISTRIBUTION. Norfolk Island.

Adult male. Crown of the head, lores and fore-head crimson ; occiput, nape and hind-neck deep grass-green ; back of the head, lower back, rump and upper tail-coverts deep grass-green ; a large patch of dull crimson-red on each side of the rump ; lesser, median and greater wing-coverts grass-green ; primary-coverts purplish-blue ; quills blackish-brown on the inner web and purplish-blue, fringed with yellowish-green, on the outer web ; tail-feathers dark grass-green, shafts black ; sides of the face and cheeks bright green ; a patch of dull crimson behind the eye ; chin, throat and remainder of the under-surface bright yellowish-green, brighter on the middle of the abdomen ; under wing-coverts and axillaries greenish-blue ; quills below brownish-ash. Bill flesh-colour, blue and black, eyes bright orange-red, feet dark flesh-grey. Total length 300 mm. : culmen 22, wing 142, tail 158, tarsus 23. Figured. Collected at Middlegate, Norfolk Island, on the 1st of August, 1912.

Adult female. Fore-head, lores and fore-part of the crown dull crimson, each feather green at the base ; back of the head, neck, mantle, scapulars, rump and upper tail-coverts beautiful grass-green, a small patch of dull crimson on each side of the rump ; tail-feathers dark green with black shafts, all the feathers being shot with bluish-green, especially towards the shafts ; primaries and secondaries black on the inner web, with a bar of yellowish-white across each web ; greater primary-coverts and outermost primaries bright blue on the outer web ; outer webs of the innermost primaries and secondaries green like the back ; cheeks, throat, chest and feathers round the eye light grass-green ; middle of the breast, belly and under tail-coverts yellowish-green ; under-surface of the tail dull olive-green. Eyes yellow, bill blue-grey, feet flesh-grey. Total length 298 mm. : wing 133, tail 146, tarsus 21, culmen 20. Collected at Steels Point, Norfolk Island, on the 27th of May, 1913. The sexes are practically alike.

Immature have less red on the fore-head.

Nest and eggs not described.

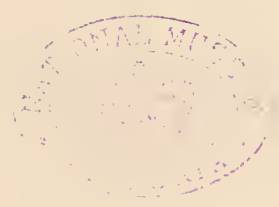


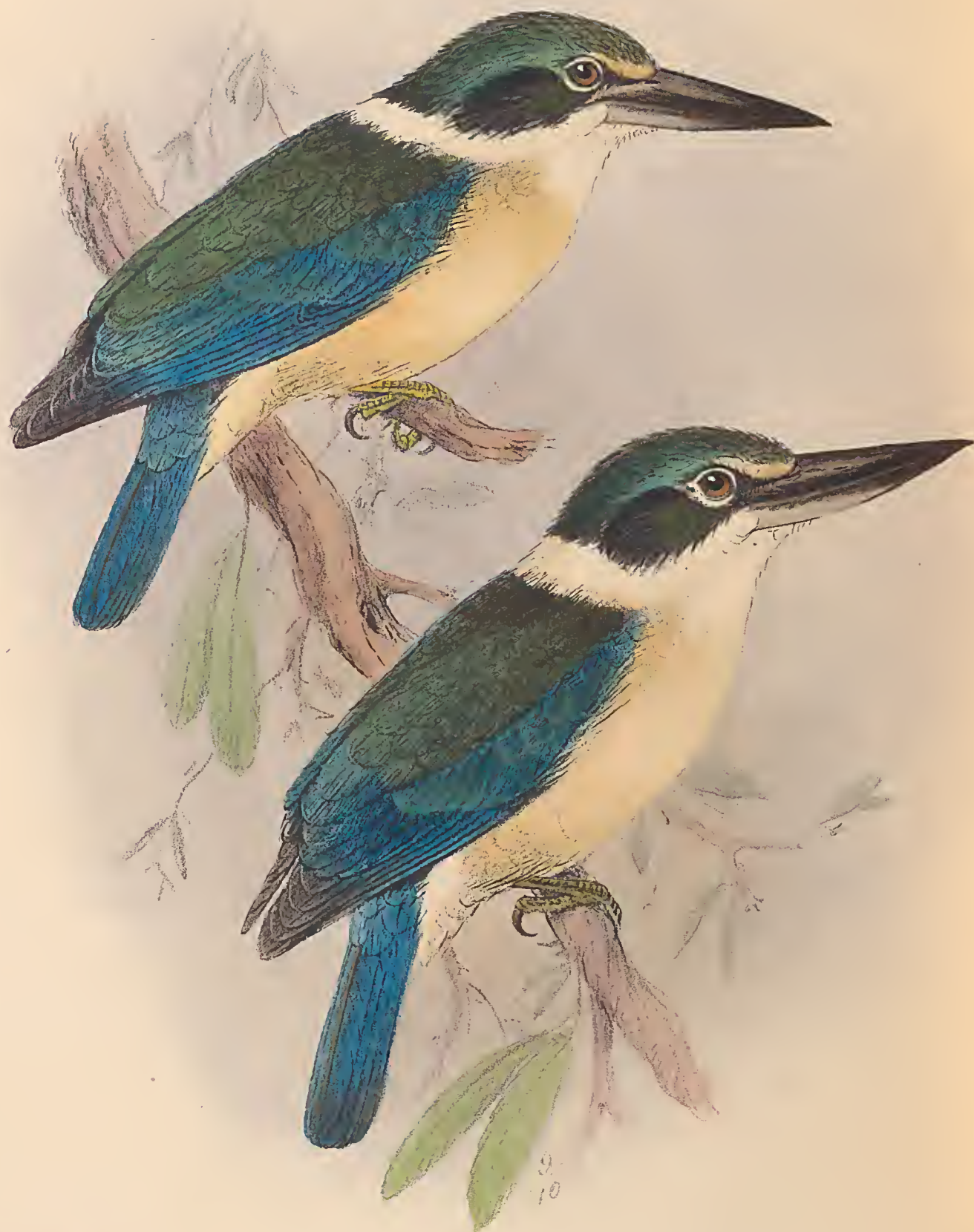
H. Gronvold, del.

Witherby & Co.

CYANORAMPHUS VERTICALIS
(NORFOLK ISLAND GREEN-PARROT.)







H. Grönvold, del.

Witherby & Co.

SAUROPATIS NORFOLKIENSIS

(NORFOLK ISLAND KINGFISHER)

SAUROPATIS ADAMSI

(LORD HOWE ISLAND KINGFISHER.)

SAUROPATIS SANCTA.

(*NORFOLKIENSIS*.)

NORFOLK ISLAND KINGFISHER.

(PLATE 18.)

SAUROPATIS Cabanis und Heine, Mus. Heine., Vol. II., p. 158, (after Jan. 20th) 1860. Type (by subsequent designation, Sharpe, Monogr. Alced., p. xiv., Jan. 1st, 1871): *Halcyon sanctus* Vigors and Horsfield.

HALCYON SANCTUS Vigors and Horsfield, Trans. Linn. Soc. (Lond.), Vol. XV., p. 206, Feb. 17th, 1827: New South Wales.

Halcyon norfolkiensis Tristram, Ibis, Jan. 1885, p. 49: Norfolk Island.

Sauropatis sancta norfolkiensis Mathews, Syst. Av. Australas., p. 380, June 13th, 1927.

DISTRIBUTION. Norfolk Island.

Adult male. Scapulars and upper back verditer-green; lower back, rump, upper tail-coverts, lesser, median and greater coverts ultramarine-blue; quills greyish-black margined on the outer web with ultramarine-blue; tail-feathers similarly coloured with shining black shafts; fore-head and crown of head blackish-brown, faintly tinged with bluish-green; occiput and nape greenish-blue; a black band surrounding the back of the head joining on to the ear-coverts; lores buff; eyebrow white, mixed with black; feathers round the eye black; sides of face, ear-coverts, cheeks, chin and throat white; sides of the neck and the remainder of the under-surface rich creamy-buff, more pronounced on the sides of the body. Bill black, with lower base grey, eyes brown, feet brownish-yellow. Total length 195 mm.: culmen 38, wing 100, tail 64, tarsus 13. Figured. Collected on Mt. Pitt, Norfolk Island, on the 7th of October, 1912.

Adult female. Feathers of the top of the head blackish-brown, very indistinctly bordered with light brown; back and sides of the head washed with dull olive-green with a few concealed white feathers on the lower neck; a broad band of black from below the eye, round the hind-neck, succeeded by a broad collar of whitish-buff; back and scapulars blackish-brown washed with dull olive-green; lower back, rump and upper tail-coverts verditer-green, brightest on the upper tail-coverts; lesser and median wing-coverts dull olive-green; primary-quills black, widely margined on the outer web with verditer-blue; secondaries black on the inner webs and verditer-blue on the outer webs; tail-feathers verditer-blue, with the shafts shining black; lores whitish-buff, this colour continued in a faint line over the eyes; sides of the face, ear-coverts and cheeks black; chin and throat white, tinged with cream-colour; sides of the neck, fore-neck, chest and breast creamy-buff with faint blackish margins; abdomen creamy-white; sides of the body, flanks, thighs and under tail-coverts buff; under wing-coverts and axillaries tawny; quills below dark grey with the inner web lighter grey. Bill black, basal half of the lower mandible buffish, feet dark brown, tinged with yellow, eyes dark brown. Total length 200 mm.: culmen 39, wing 103, tail 67, tarsus 13. Collected on Mt. Pitt, Norfolk Island, on the 26th of August, 1912.

Adult male. Similar to the adult female.

NORFOLK ISLAND KINGFISHER.

Immature. Fore-head black, a few of the feathers indistinctly margined with buff; sides and back of the head black, glossed with dull olive-green; a broad buff collar surrounding the hind-neck, each feather white at the base and broadly tipped with black; scapulars and upper back black, glossed with olive-green; lower back, rump and upper tail-coverts cobalt-blue; lesser wing-coverts, median and greater coverts and primary-coverts cobalt-blue; quills black, broadly margined on the outer web with deep cobalt-blue, secondaries black on the inner web and greenish-cobalt on the outer web; tail-feathers cobalt-blue, shafts shining black; lores rich buff, freckled with black; eyebrow whitish; feathers round the eyes black; sides of face, checks and ear-coverts black, tinged with dull olive-green; chin and throat white, the feathers of the lower throat indistinctly margined with black; fore-neck, chest, breast, side of the body, flanks and thighs rich buff, black at the tips, producing a somewhat barred appearance; abdomen and under tail-coverts uniform rich buff; under wing-coverts and axillaries rich pinkish-buff; quills below dark grey, pinkish-grey on the innermost web. Bill black, basal half of lower mandible grey, feet greyish-black, eyes dark brown. Collected near the Cascades, Norfolk Island, on the 5th of May, 1913.

Eggs. Clutches of 3 and 4 eggs were found on the 10th of December, 1912. The eggs are white and glossy, and measure: 27.4×22 , 29×22.5 , 27×22.8 ; 29.5×22.1 , 28×23.5 , 29.3×22.3 , 28×22.5 mm.

Breeding-season. December.

SAUROPATIS SANCTA.

(ADAMSI.)

LORD HOWE ISLAND KINGFISHER.

(PLATE 18.)

SAUROPATIS [*sic*] *SANCTUS ADAMSI* Mathews, Austral Av. Rec., Vol. III., No. 3, p. 68, April 7th, 1916: Lord Howe Island.

Sauropatis sanctus adamsi Mathews, Austral Av. Rec., Vol. III., No. 3, p. 68, April 7th, 1916; *id.*, Syst. Av. Australas, p. 380, June 13th, 1927.

DISTRIBUTION. Lord Howe Island.

Adult male. Upper back and scapulars dull bluish-green; lower back, rump, upper tail-coverts, lesser and median wing-coverts bluish-green; greater wing-coverts ultramarine-blue; quills ashy-black, margined on the outer web with greenish-blue; tail-feathers purplish-blue with shining black shafts; fore-head, crown of head and occiput brownish-black tinged with greenish-blue; nape and hind-neck dull greenish-blue, a band of black feathers surrounding the back of the head, joining the ear-coverts; a broad white collar round the hind-neck, with a few mixed feathers of buff; lores buffish-white, shading into the narrow white eye-brow; feathers round the eye black; sides of the face, ear-coverts and cheeks black, shaded with dull green; cheeks, chin and throat white; remainder of the under-surface of the body creamy-buff, excepting the under tail-coverts which are white; under wing-coverts and axillaries rich creamy-buff; quills below ash, widely margined on the inner web with pale buff. Bill black, with lower base grey, eyes brown, feet blackish-yellow. Total length 225 mm.: culmen 43, wing 95, tail 61, tarsus 14. Figured. Collected on Lord Howe Island on the 14th of October, 1913.

Adult female. Head brownish-black, tinged with dull green, especially on the sides; back and scapulars dull olive-brown; lower back and rump dull greenish-blue; upper tail-coverts bright greenish-blue; lesser wing-coverts dull olive-brown; median and greater coverts bluish-green; quills blackish-brown, margined on the outer web with olive; tail-feathers blue with black shafts; lores bluish-white, this colour continued over the eye; feathers round the eye black; sides of the face, ear-coverts and cheeks black tinged with dull green; chin and throat pure white; sides of the neck whitish-buff, this colour continued in a collar round the hind-neck; chest and breast rich creamy-buff, continued on to the sides of the body; abdomen white; flanks rich buff; under tail-coverts creamy-white; under wing-coverts and axillaries rich buff; quills below blackish, margined on the inner web with pale buff. Bill black, basal half of lower mandible buffish, feet dark yellowish-grey, eyes dark brown. Total length 225 mm.: culmen 43, wing 100, tail 63, tarsus 14. Collected at the Pines, Lord Howe Island, on the 8th October, 1913.

Adult male. Similar to the adult female.

This bird has a much wider, heavier bill than specimens from Norfolk Island.

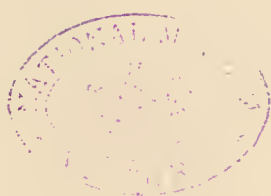
Immature female. Head brownish-black, each feather very faintly margined with dusky; fore-head more distinctly margined with pale buff, and a few concealed white feathers at the base of the neck; a broad black band surrounding the neck from the ear-coverts, succeeded by another broad band of white feathers tipped with black; back and scapulars dull blackish-

LORD HOWE ISLAND KINGFISHER.

brown ; lower back verditer-green ; rump and upper tail-coverts brighter verditer-green ; lesser, median and greater wing-coverts dull verditer-green, each feather margined with buff, producing a uniform waved appearance ; primary-quills brownish-black, margined on the outer web with dull blue and on the inner web with pale buff ; secondaries brownish-black on the inner web, the outer web dull blue ; tail-feathers dull verditer-blue with shining black shafts ; lores rich buff ; eye-brow dull bluish-green mixed with white ; feathers round the eye black, with a narrow line of white feathers below the eye ; side of the face, ear-coverts and cheeks black, joining the black collar ; chin and throat pure white ; lower throat white with dusky tips to each feather ; sides of the neck pale buff, freckled with black ; fore-neck and chest white with broad dusky-black margins ; breast and abdomen white, strongly shaded with pink ; sides of the body, flanks and thighs rich buff ; under tail-coverts whitish-buff ; under wing-coverts and axillaries rich tawny-buff. Eyes dark brown, bill black, base of lower mandible horn, feet dark yellowish-grey. Collected at the Pines on the 28th of February, 1914.

Immature male. Top of the head black, shaded with dull grey, each feather margined with buff ; back of the head and lower neck dull bluish-green, a broad ring of black feathers surrounding the neck, joining the ear-coverts, followed by a broad collar of rich creamy-buff ; scapulars and upper back brownish-black, faintly glossed with dull green ; lower back, rump and upper tail-coverts bright cobalt-blue ; lesser wing-coverts blackish-brown ; median coverts greenish-blue, each feather margined with a rich buff, producing a waved appearance ; primary-quills brownish-black, margined on the outer web with cobalt-blue ; secondaries brownish-black on the inner web, with the outer webs cobalt-blue ; tail-feathers cobalt-blue, the central pair brightest ; shafts of all the quills shining black ; lores rich buff, this colour continued in a thin line over the eye ; eyebrow white, changing into greenish-blue down the sides of the crown ; feathers round the eye black ; sides of the face and ear-coverts black ; cheeks rich creamy-buff, continued round the hind-neck where it broadens out to form a wide collar ; chin and upper throat pure white ; lower throat white, some of the feathers with indistinct black tips ; fore-neck, chest and breast rich buff, each feather broadly margined with black ; abdomen, sides of the body, flanks, thighs, under wing-coverts and axillaries rich reddish-buff. Eyes brown, bill black, base of lower mandible dark horn, feet dark yellowish-grey. Collected at the Pines, Lord Howe Island, on the 28th of February, 1914.

Eggs. These will probably not differ appreciably from the eggs of the Norfolk Island bird.





H. Grönvold, del.

URODYNAMIS TAITENSIS
(LONG-TAILED CUCKOO)

Witherby & Co

URODYNAMIS TAITENSIS.

LONG-TAILED CUCKOO.

(PLATE 19.)

URODYNAMIS Salvadori, Ornit. Pap. e Moll., Vol. I., p. 370, 1880 (pref. June 15th, 1879). Type (by original designation) : *Cuculus taitensis* Sparrman.

CUCULUS TAITENSIS Sparrman, Mus. Carlson., fasc. ii., No. xxxii., 1787 : Tahiti.

Society Cuckoo Latham, Gen. Synops. Birds, Vol. II. (Vol. I., pt. ii.), p. 514, 1782 : Otaheite.

Cuculus taitensis Sparrman, Mus. Carlson., fasc. ii., No. xxxii., 1787 : Tahiti.

Cuculus tahitiensis Gmelin, Syst. Nat., Vol. I., pt. 1, p. 412, July 25th, 1788 : Tahiti.

Cuculus perlatus Vieillot, Nouv. Dict. Hist. Nat., Vol. VIII., p. 232, March 15th, 1817 : Tahiti.

Cuculus fasciatus Forster, Discr. Anim., ed. Licht., p. 160, (pref. Jan.) 1844 : Tahiti.

Eudynamis cuneicauda Peale, United States Explor. Exped., Birds, p. 139, (in or before Oct.) 1848 : Ovalau, Fiji Islands (fig. as *E. tahitiensis* Cassin, *ib.*, 2nd, pl. 22, 1858).

Eudynamis taitensis Buller, Birds of New Zealand, 1st edn., p. 73, pl. 8, 1873 : New Zealand ; *id.*, 2nd edn., Vol. I., p. 127, pl. 14, March 1888 : New Zealand ; Mathews, Nov. Zool., Vol. XVIII., p. 448, Jan. 1912.

Urodynamis taitensis Shelley, Cat. Birds Brit. Mus., Vol. XIX., p. 314, 1891 (pref. March 28th).

Urodynamis taitensis Mathews and Iredale, Austral. Av. Rec., Vol. IV., p. 110, Dec. 16th, 1920 ; Mathews, List Birds Austr., p. 321, Dec. 1913 : Norfolk Island ; *id.*, Syst. Av. Australas., p. 419, June 13th, 1927.

Urodynamis taitensis philetus A. Wetmore, Proc. Biol. Soc. Wash., Vol. XXX., p. 1, Jan. 22nd, 1917 : Otago Prov., New Zealand.

Urodynamis taitensis belli Mathews, Bull. Brit. Orn. Club, Vol. XXXIX., p. 24, Nov. 30th, 1918 : Norfolk Island.

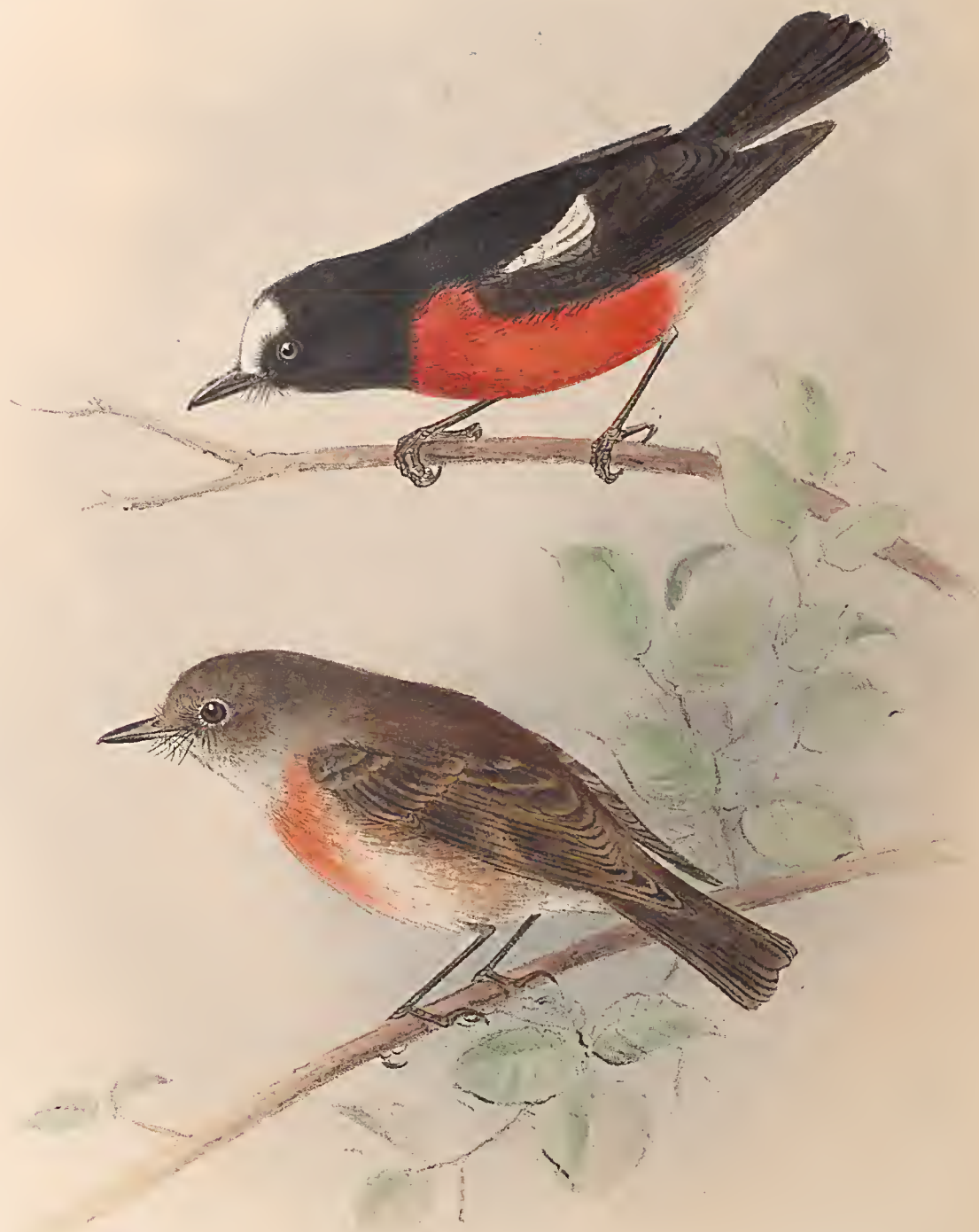
DISTRIBUTION. New Zealand, Norfolk Island, Fiji and Society Islands.

Adult male. Crown of the head, occiput, nape, hind-neck and fore-head blackish-brown, shafts of all the feathers white at the base and with the terminal two-thirds brownish-buff ; lores blackish ; eyebrow white, mixed with reddish-buff ; sides of the face, ear-coverts and cheeks blackish-brown with buff shaft-stripes ; lower back, rump, upper tail-coverts, lesser, median and greater wing-coverts and primary-quills dark chocolate-brown, barred with deep brownish-buff ; tail-feathers similar in colour and markings to the back but each feather widely tipped with white ; chin, throat, sides of the neck and fore-neck white, each feather with a wedge-shaped mark of blackish-brown ; chest, breast, abdomen and sides of the body pure white, with a long broad streak of blackish-brown at the end of each feather ; flanks and thighs white with broad V-shaped markings of dark umber-brown ; under tail-coverts white barred with black ; under wing-coverts and axillaries rich creamy-buff ; quills below ash-brown, widely barred with creamy-white, tinged with rufous ; upper mandible dark grey, lower light grey, eyes dark brownish-yellow, feet dark yellowish-green. Total length 420 mm. : culmen 25, wing 202, tail 228, tarsus 34. Figured. Collected at Watermill Creek, Norfolk Island, on the 2nd of November, 1912.

LONG-TAILED CUCKOO.

Immature male. Top of the head, nape and hind-neck brownish-black, each feather with a drop-like marking of light buff; back, mantle, scapulars, rump, upper tail-coverts, lesser, median and greater wing-coverts dull brownish-black, each feather with a concealed bar of pale buff and with a large round spot of whitish-buff near the extremity of each feather; primary-quills and tail-feathers dark brownish-black, barred with yellowish-buff; lores and eyebrow rich yellowish-buff, mixed with blackish; ear-coverts blackish-brown, shafts buff; a line of black from the angle of the mouth down the sides of the neck and another bordering the throat; chin and throat rich golden-buff, faintly tipped with black; sides of neck, fore-neck, chest, breast, abdomen, sides of the body, flanks and thighs golden-buff with a broad band of black down the shafts; under tail-coverts golden-buff, barred with blackish-brown; under wing-coverts and axillaries rich golden-buff; quills below greyish-ash, barred with yellowish-buff; upper mandible dark grey, lower light grey, eyes greenish-grey, feet light green, tinged with yellow. Total length 365 mm.: culmen 20, wing 179, tail 202, tarsus 35. Figured. Collected on Norfolk Island on the 17th of March, 1913.

The egg is deposited in another bird's nest.



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PETROICA MULTICOLOR.
(NORFOLK ISLAND ROBIN).

PETROICA MULTICOLOR.

NORFOLK ISLAND ROBIN.

(PLATE 20.)

PETROICA Swainson, Zool. Illustr., 2nd Ser., Vol. I., p. 39, 1829. Type (by monotypy) : *Muscicapa multicolor* Gmelin.

MUSCICAPA MULTICOLOR Gmelin, Syst. Nat., Vol. I., pt. ii., p. 944, April 20th, 1789 : Norfolk Island.

Red-bellied Flycatcher Latham, General Synops. Birds, Vol. II., pt. 1, p. 343, pl. L., 1783 ; *id.*, General History Birds, Vol. VI., p. 209, pl. c., 1823 : Norfolk Island.

Muscicapa multicolor Gmelin, Syst. Nat., Vol. I., pt. ii., p. 944, April 20th, 1789.

Muscicapa erythrogastra Latham, Index Ornith., Vol. II., p. 479, before Dec. 9th, 1790. New name for *multicolor* Gmelin.

Rose-breasted Flycatcher Latham, Suppl. ii., Gen. Synops., p. 223, 1801 : New South Wales error = Norfolk Island.

Muscicapa rhodogastra Latham, Index Ornith. Suppl., p. LII., after May 30th, 1801 : New South Wales error = Norfolk Island (Watling drawing No. 183).

Petroica modesta Gould, Synops. Birds Austr. and Adj. Isl., pt. iv., Append., p. 3, April 1838 : East coast of New Holland error = Norfolk Island.

Petroica pulchella Gould, Proc. Zool. Soc. (Lond.), 1839, p. 142, March 1840 : Norfolk Island.

Muscicapa dibapha Forster, Descr. Anim. ed. Licht., p. 267, (pref. Jan.) 1844 : Norfolk Island.

Petroica erythrogastra Gould, Birds Austr., pt. xxvii., Vol. III., pl. 4, 1847 : Norfolk Island ; *id.*, Handb. Birds Austr., Vol. II., p. 526, 1865, Dec.

Petroica multicolor Sharpe, Cat. Birds Brit. Mus., Vol. IV., p. 168, March 26th, 1879.

Petroica multicolor multicolor Mathews, Nov. Zool., Vol. XVIII., p. 449, Jan. 1912 ; *id.*, List Birds Austr., p. 321, Dec. 1913.

DISTRIBUTION. Norfolk Island.

Adult male. Fore-head, to a line between the eyes, satiny-white ; remainder of the upper-surface, including the lores, deep black ; primary-quills and secondaries brownish-black ; a large patch of white on the secondary-coverts ; feathers of the rump very dense and fringed at the tips with white ; tail-feathers brownish-black, fringed at the extremity with white ; sides of the face, ear-coverts, cheeks, chin and throat black ; sides of the neck, chest, breast and belly scarlet ; middle of the abdomen and under tail-coverts white, as also the sides of the body ; under wing-coverts and axillaries also white ; under-surface of the quills ash-brown. Bill black, eyes dark grey, feet black tinged with greyish-brown. Total length 120 mm. : wing 73, culmen 11, tarsus 23, tail 48. Figured. Collected at Dixey, Norfolk Island, on the 9th of January, 1913.

Adult female. Feathers at the base of the mandible brownish-white ; top of the head and back of the neck ash-brown ; scapulars, back and mantle dark olive-brown ; feathers of the rump very dense, fluffy, and dark olive-brown in colour, tipped at the extremity with

NORFOLK ISLAND ROBIN.

white; primary-quills dark ash-brown; secondaries similarly coloured but fawn-buff at the base; tail ash-brown, the outer pairs with the middle portion buffy-white on the outer web and with a spot on the inner web at the extremity; chin and sides of the throat tinged with pink; chest and middle of the belly reddish-pink; breast, abdomen and under tail-coverts white; sides of the body brownish-buff; under wing-coverts and axillaries greyish-white; under aspect of quills ash-brown. Bill brownish-black; eyes dark greyish-brown; feet dark brown. Total length 119 mm.: wing 68, culmen 11, tarsus 23, tail 48. Figured. Collected Steels Point, Norfolk Island, on the 23rd of October, 1912.

Another male, either immature or a colour phase, collected at Mount Pitt, Norfolk Island, on the 7th of September, 1912, resembles the described female, except that the chest is yellowish-orange and not reddish-pink. Bill black, eyes dark brown, feet brownish-black.

Immature. Top of the head and back of the neck dark umber-brown, lighter on the fore-head; scapulars, mantle, back, rump and upper tail-coverts darker umber-brown; wing-coverts like the head, faintly margined with buff; primaries and secondaries blackish-brown, the outermost primaries uniform, the remainder with a buff bar across the basal half, widest on the innermost secondaries; tail-feathers dark blackish-brown, the outermost pairs with the margin of the outer webs buff; throat, middle of the breast, belly and under tail-coverts white; sides of the chest, sides of the body and flanks reddish-buff; under wing-coverts and axillaries white, tinged with buff. Bill yellowish-black, eyes dark brown, feet yellowish-brown. Collected on Mount Pitt, Norfolk Island, on the 7th of September, 1912.

Breeding-season. October to January-

Nest and eggs. The nests are placed in a fork of branches covered with lichens (*Usnea articulata*). They consist of dry, thin stems of small plants, decayed skeleton leaves, moss, etc., are decorated outside with flake-like lichens (*Parmelia perlata* and *Sticta* spec.) and lined with sheeps' wool and feathers; they are usually more or less interwoven with the lichen covering the twigs. They contain 2 eggs, which were found in October and December, 1912. The eggs are glossless greenish-white, spotted with paler and darker brown, and some with deeper lying mauve patches; held against the light they shine through pale green. They measure: 18.6×15 , 18.5×15 ; 18.6×15.1 , 18.5×15.5 ; 19×15.3 , 19×15.1 ; 19.6×15.5 ; 18.3×55 , 18.3×45 mm.



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ROYIGERYGONE MODESTA
 (NORFOLK ISLAND FLY-EATER)
 ROYIGERYGONE INSULARIS
 (LORD HOWE ISLAND FLY-EATER.)

ROYIGERYGONE INSULARIS.

LORD HOWE ISLAND FLY-EATER.

(PLATE 21.)

ROYIGERYGONE Mathews, Austral Av. Rec., Vol. I., pt. v., p. 110, Dec. 24th, 1912. Type (by original designation): *Gerygone matthewsæ* Mathews=*Gerygone modesta* Pelzeln.

GERYGONE INSULARIS Ramsay, Proc. Linn. Soc. (N.S.W.), Vol. III., p. 117, Sept. 1878: Lord Howe Island.

Gerygone insularis Ramsay, Proc. Linn. Soc. (N.S.W.), Vol. III., p. 117, Sept. 1878; Mathews, Nov. Zool., Vol. XVIII., p. 448, Jan. 1912.

Gerygone thorpei Ramsay, Proc. Linn. Soc. (N.S.W.), Ser. ii., Vol. II., p. 677, March 21st, 1888: Lord Howe Island; Mathews, Handl. Birds Austr., p. 63, Jan. 1908.

Royigerygone insularis Mathews, List Birds Austr., p. 322, Dec. 1913; Mathews and Iredale, Austral. Av. Rec., Vol. IV., p. 109, Dec. 16th, 1920.

DISTRIBUTION. Lord Howe Island.

Adult male. Head and hind-neck pale olive-brown; fore-head whitish; scapulars, lower back and rump olive-brown shading into greenish-olive in the upper tail-coverts; wing-coverts olive-brown; primary-quills brownish-ash bordered on the outer web with yellowish-olive; middle pair of tail-feathers ash-brown, with an indistinct blackish patch towards the extremity, remaining pairs olive-brown at the base, blackish towards the extremity and with a triangular patch of white near the tip; lores whitish; sides of face, ear-coverts, cheeks, chin and throat light greyish-white; sides of neck and fore-neck greyish-white; breast, abdomen, sides of body, flanks and thighs pale primrose-yellow; under tail-coverts white; under wing-coverts and axillaries white, tinged with yellowish; quills below ash-colour, whitish on the margins of the inner web. Bill dark greyish-black, eyes pink, feet dark blue-grey. Total length 125 mm.: culmen 10, wing 58, tail 50, tarsus 23. Figured. Collected at the Pines, Lord Howe Island, on the 11th of May, 1914.

Adult female. Similar to the adult male.

Immature. Entire upper-surface brownish-olive, brightest on the rump; primaries and secondaries ash-brown, narrowly margined on the outer web with olive; tail-feathers brownish-olive, blackish-brown across the middle and with a large spot of white on the inner web near the extremity; lores, chin and throat yellowish-white; chest, breast and abdomen pale yellow; under tail-coverts yellowish-white; under wing-coverts and axillaries white, tinged with yellow. Bill black, eyes light pink, feet greyish-black. Collected at Mrs. Nichols, Lord Howe Island, on the 4th of August, 1913.

Younger. Top of the head, back and wings brown, tinged with olive; fore-head paler; primaries and secondaries narrowly margined on the outer web with olive; tail-feathers olive-brown, lighter on the outer web, with a broad band of blackish-brown across the middle and another broad band of white near the extremity; lores dull yellow; chin, throat, sides of the face, chest, breast, sides of the body and abdomen pale sulphur-yellow; under tail-coverts dull yellow; under wing-coverts and axillaries white, tinged with yellow; under aspect of quills ash, lightest on the margins of the inner web. Bill dark grey, eyes pink, feet dark blue-grey. Collected at the Pines, Lord Howe Island, on the 29th of January, 1914.

Nest and eggs not described.

ROYIGERYGONE MODESTA.

NORFOLK ISLAND FLY-EATER.

(PLATE 21.)

GERYGONE MODESTA Pelzeln, Sitz. Ak. der Wiss., Vol. XLI., p. 320, 1860 (after June 8th):
Norfolk Island.

Gerygone modesta Pelzeln, Sitz. Ak. der Wiss., Vol. XLI., p. 320, 1860 (after June 8th).

Pseudogerygone modesta Mathews, Handl. Birds Austral., p. 63, Jan. 1908.

Gerygone mathewsæ Mathews, Nov. Zool., Vol. XVIII., p. 449, Jan. 1912. New name for *modesta*.

Royigerygone modesta Mathews, List Birds Austr., p. 322, Dec. 1913; Mathews and Iredale,
Austral. Av. Rec., Vol. IV., p. 110, Dec. 16th, 1920.

DISTRIBUTION. Norfolk Island.

Adult male. Occiput, nape, hind-neck, lower back, rump and upper tail-feathers, dull olive-brown, brightest on the rump and upper tail-coverts; primary-quills brownish-ash, faintly margined on the outer web with olive; middle pair of tail-feathers uniform ash-brown, with a broad band of blackish-brown across the middle half and a triangular patch of white near the extremity; feathers surrounding the eye white; sides of the face, cheeks, ear-coverts, throat, sides of the neck, chest and breast leaden-grey; middle of abdomen creamy-white; sides of the body, flanks and thighs dark grey, tinged with olive; under tail-coverts white tinged with yellow; under wing-coverts and axillaries white, slightly tinged with yellow; quills below ash-grey, with the margins of the inner web whitish. Bill black, eyes bright pink, feet blue-black. Total length 106 mm.: culmen 9, wing 56.5, tail 47, tarsus 20. Figured. Collected at Middlegate, Norfolk Island, on the 21st of May, 1913.

Adult female. Similar to the adult male. Crown of the head, occiput, nape, hind-neck, lower back, rump and upper tail-coverts uniform olive-brown, brightest on the upper tail-coverts; primary-quills brownish-ash, very faintly margined on the outer web with olive; middle pair of tail-feathers uniform ash-brown, with a broad band of blackish-brown across the middle and a triangular patch of white near the extremity; feathers round the eye pure white; sides of the face, ear-coverts and cheeks light grey; chin white; throat, sides of the neck and fore-neck light grey; chest, breast, abdomen, flanks, thighs and under tail-coverts white; sides of the body olive-yellow; under wing-coverts and axillaries white, tinged with yellow; quills below ash-grey. Bill black, eyes bright pinkish-red, feet dark bluish-grey. Total length 95 mm.: culmen 9, wing 52, tail 43. Figured. Collected at Dixey, Norfolk Island, on the 8th of May, 1913.

Immature. Entire upper-parts dark brown, washed with dark olive; primaries and secondaries dark ash-brown, margined on the outer web with olive; tail-feathers brownish-olive, blackish in the middle and with a large spot of white on the inner web near the extremity; under-parts whitish strongly tinged with olive-yellow, especially on the sides of the body; under wing-coverts and axillaries very pale yellow; under surface of primary-quills greyish-ash, lighter on the margins of the inner web. Bill light grey, eyes light pink, feet light grey, tinged with yellow. Collected near Dixey, Norfolk Island, on the 7th of March, 1913.

NORFOLK ISLAND FLY-EATER.

Male (nearly adult). Entire upper-surface greyish-olive, paler on the fore-head; primary-quills brownish-ash, very narrowly margined on the outer web with whitish; secondaries uniform brownish-ash; tail-feathers olive-brown, with a broad band of blackish-brown across the middle and a large spot of white on the margin of the inner web, near the extremity; chin, sides of the face and throat pale yellow, washed with olive; chest, breast, sides of the body and abdomen pale olive-yellow, brightest on the latter; under tail-coverts white, slightly tinged with yellow; under wing-coverts and axillaries white, slightly washed with yellow; under-surface of wings ash, palest on the margins of the inner webs. Collected on the 11th of June, 1903.

Nest and eggs. The nests are suspended from a twig, with a lateral entrance-hole near the top, the bottom being rounded off. The nests are constructed of dead stalks and strings of grass, skeleton leaves, rootlets, moss, fibres and feathers, also sometimes lichens. They are lined with feathers and contain 3 eggs, clutches of 2 probably being incomplete. Sometimes the nests are built firmly into a mass of fibrous lichens, *Usnea articulata*. The eggs were found in October, November and December. They have no gloss or are sometimes slightly glossy, white, and with numerous small bright brick-red spots and dots, sometimes with larger and somewhat browner spots. They measure: 16.5×13.1 , 16.4×13.3 , 18×12.6 ; 16.5×12.5 , 16.2×12.1 , 16×12.5 ; 18.5×13.5 , 18.5×13.3 , 18.5×13.8 ; 18.3×14.5 ; 18×14.5 ; 17.5×13.5 , 17.5×13.6 , 17.3×13.3 ; 17.5×12.5 , 16.7×12.5 ; 16.6×13.3 , 16×12.5 mm.

Breeding-season. October, November and December.

PACHYCEPHALA PECTORALIS.

(CONTEMPTA.)

LORD HOWE ISLAND THICK-HEAD.

(PLATE 22.)

PACHYCEPHALA Vigors and Horsfield, Trans. Linn. Soc. (Lond.), Vol. XIV., pt. iii., p. 444, (before July) 1825. Type (by original designation): *Muscicapa pectoralis* Latham.

MUSCICAPA PECTORALIS Latham, Index Ornith. Suppl., p. li., after May 30th, 1801: Port Jackson, New South Wales.

Pachycephala contempta Hartert, Bull. Brit. Orn. Club, Vol. VIII., p. xv., Nov. 28th, 1898: Lord Howe Island; Mathews, Handl. Birds Austral., p. 85, Jan. 1908.

Pachycephala howensis North, Rec. Austr. Mus., Vol. V., pt. ii., p. 125, Jan. 28th, 1904: Lord Howe Island.

Pachycephala gutturalis contempta Mathews, Nov. Zool., Vol. XVIII., p. 449, Jan. 1912.

Pachycephala pectoralis contempta Mathews, List Birds Austr., p. 322, Dec. 1913.

DISTRIBUTION. Lord Howe Island.

Adult male. Fore-head, crown of head, occiput, nape, lores, sides of the face and ear-coverts, jet black with a slight gloss; a broad band of golden-yellow round the hind-neck; scapulars, lower back, rump and upper tail-coverts uniform olive-green; lesser, median and greater wing-coverts olive-green at the extremity and blackish-brown at the base; primary-quills blackish-brown, the five outermost margined on the outer web with white, remainder fringed with olive-yellow; tail-feathers olive-green on the basal half, becoming black towards the terminal half and fringed at the tips with whitish; cheeks, chin and throat pure white, encircled with a broad band of jet black; remainder of the under-parts golden-yellow; under wing-coverts and axillaries white, washed with yellow; quills below ash-grey, margined on the inner web with whitish. Bill black, eyes bright brown, feet blackish-grey. Total length 177 mm.: culmen 11, wing 92, tarsus 24, tail 76. Figured. Collected at the Pines, Lord Howe Island.

Adult female. Similar to the immature male described below.

Immature male. Fore-head, crown of the head, occiput, nape, hind-neck, fore-head, lores, sides of the face and ear-coverts brownish-olive; scapulars, lower back, rump, upper tail-coverts, lesser, median and greater wing-coverts brownish-olive, brightest on the rump and upper tail-coverts; primary-quills brownish-ash, externally narrowly margined with whitish-buff, innermost primaries widely margined with brick-red; outer secondaries widely margined with reddish, innermost secondaries fringed with olive; tail-feathers greenish-olive with brown shafts; chin and throat whitish, indistinctly waved with dull olive; remainder of the under-surface whitish-buff, brightest on the sides of the body; under tail-coverts golden-yellow; under wing-coverts and axillaries whitish; quills below ash-brown, widely margined on the inner web with reddish-buff. Bill blackish-grey, eyes brown, feet dark blue-grey. Total length 174 mm.: wing 91, culmen 11, tail 75, tarsus 23.



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PACHYCEPHALA CONTEMPTA
(LORD HOWE ISLAND THICKHEAD.)

LORD HOWE ISLAND THICK-HEAD.

Immature male. Fore-head whitish, head, neck and mantle grey, slightly washed with olive; lower back and rump green washed with brighter olive; upper tail-coverts greenish-olive; lesser wing-coverts like the mantle; median and greater wing-coverts margined with rufous; primary-quills ash-brown, the outermost ones margined on the outer web with whitish-buff, the innermost ones with reddish-chestnut; secondaries margined on both webs with reddish-chestnut; tail-feathers brownish-olive, fringed on the outer webs with greenish-olive; chin, throat and sides of the neck whitish, indistinctly freckled with brown; chest, breast and sides of the body light yellowish-buff; middle of the breast and abdomen pinkish-buff; under tail-coverts sulphur-yellow; under wing-coverts and axillaries white. Bill black, eyes reddish-brown, feet dark bluish-grey. Collected at Cat Park, Lord Howe Island, on the 6th October, 1913.

Immature female. Entire upper-surface light brown, washed with olive, and with a few scattered patches of rusty-chestnut feathers on the sides of the neck, back of the neck, mantle, rump and wing-coverts; upper tail-coverts entirely of this colour; primary-quills ash-brown, margined on the outer web of the first four with whitish-buff and the remainder with reddish-chestnut; secondaries ash-brown, outer webs reddish-chestnut, innermost secondaries uniform reddish-chestnut; tail-feathers brownish-olive, fringed on the outer webs with greenish-olive; chin and throat whitish; chest, breast and sides of the body whitish-buff; middle of the belly and abdomen pinkish-buff with a few scattered light chestnut feathers; under tail-coverts light yellow; under wing-coverts and axillaries white; under aspect of quills ash-coloured with the margins of the inner webs reddish-buff. Bill blackish-grey, eyes light brown, feet light blue-grey. Collected at the Pines, Lord Howe Island, on the 13th of January, 1914.

Nest and eggs. Two nests from Lord Howe Island are built like those of *P. xanthoprocta* from Norfolk Island. The two clutches of 2 eggs each are like the white varieties of *P. xanthoprocta* but measure only 25.1×18 , 23.8×18.1 ; 25.5×18 , 23×17.8 mm. They were found on the 28th of September and the 11th of October, 1914.

Breeding-season. September and October.

PACHYCEPHALA XANTHOPROCTA.

NORFOLK ISLAND THICK-HEAD.

(PLATE 23.)

PACHYCEPHALA XANTHOPROCTA Gould, Synops. Birds Austr. and Adj. Isl., pt. iii., pl. 55, April 1838: New South Wales error=Norfolk Island.

Pachycephala xanthoprocta Gould, Synops. Birds Austr. and Adj. Isl., pt. iii., pl. 55, April 1838; Gadow, Cat. Birds Brit. Mus., Vol. VIII., p. 211, 1883 (pref. June 28th); Mathews, Handl. Birds Austral., p. 86, Jan. 1908; *id.*, List Birds Austr., p. 322, Dec. 1913; Mathews and Iredale, Austral. Av. Rec., Vol. IV., p. 110, Dec. 16th, 1920.

Pachycephala longirostris Gould, Synops. Birds Austr. and Adj. Isl., pt. iii., pl. 55, April 1838: New South Wales error=Norfolk Island.

Pachycephala gatturalis xanthoprocta Mathews, Nov. Zool., Vol. XVIII., p. 449, Jan. 1912.

DISTRIBUTION. Norfolk Island.

Adult male. Fore-head, crown of head, occiput and nape dull grey, slightly tinged with olive; lores whitish; scapulars, hind-neck and lower back dull olive; rump and upper tail-coverts greenish-olive; lesser, median and greater coverts dull olive, outwardly margined with yellowish-olive; primary-quills hair-brown on the inner web and margined on the outer web with yellowish-buff; tail-feathers ash-grey, broadly margined with greenish-olive; sides of the face, ear-coverts, cheeks, chin and throat greyish-white, faintly tipped with brown, producing an indistinct barred appearance; sides of neck, fore-neck, chest, breast, abdomen, sides of body, flanks and thighs light primrose-yellow; under tail-coverts bright yellow; under wing-coverts and axillaries greyish-white. Bill black, eyes dark brown, feet brownish-black. Total length 167 mm.: culmen 16, wing 99, tail 75, tarsus 26. Figured. Collected at Stockyard Creek, Norfolk Island.

Adult female. Crown of head and occiput ashy-grey; scapulars, nape, hind-neck, lower back, rump and upper tail-coverts greenish-olive, brightest on the rump and upper tail-coverts; lesser and median wing-coverts dull olive, tipped with whitish, forming a bar on the greater coverts; quills greyish-ash, margined on the outer web with olive-brown; tail-feathers bright greenish-olive, with the shafts blackish-brown; cheeks, chin and throat whitish, indistinctly barred with ashy-brown and suffused with pale buff; sides of the neck and fore-neck, chest, breast, abdomen, sides of the body, flanks and thighs yellow, suffused with pale buff; under tail-coverts bright yellow; under wing-coverts and axillaries buffish-white; quills below ash, widely margined on the inner web with whitish buff. Bill black, greyish at the base, eyes reddish-brown, feet dark bluish-grey. Total length 175 mm.: culmen 15, wing 95, tail 76, tarsus 26. Figured. Collected at Kingston, Norfolk Island, on the 9th of May, 1913.

Immature male. The whole of the head dark grey, tinged with olive; back, scapulars and rump brighter than the head; upper tail-coverts greenish-olive; primary-quills brownish-ash; the outermost ones margined on the outer web with whitish-buff, the innermost ones with reddish chestnut; secondaries brownish-ash, broadly margined on the outer web with reddish-chestnut; tail-feathers brownish-olive with the outer webs bordered



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PACHYCEPHALA XANTHOPROCTA
 (NORFOLK ISLAND THICKHEAD.)

NORFOLK ISLAND THICK-HEAD.

with greenish-olive; chin, throat and sides of the neck yellowish-white, indistinctly flecked with brown; chest bright brownish-buff; belly and abdomen buffy-white; under tail-coverts pale primrose-yellow; under wing-coverts and axillaries greyish-white; under-surface of quills dark ash, with the inner web whitish-buff. Collected on Norfolk Island on the 6th of June, 1903.

Nest and eggs. The cup-shaped nest is not very deep and composed of small twigs, rootlets, stalks of grass and other small plants, skeleton leaves, sometimes sheeps' wool, pieces of thread, paper, etc., lined with uniform fine stalks and grasses. They contain 2 or 3, and in two cases 4 eggs. The latter vary from white (seldom) to brownish-buff and are somewhat glossy. They are marked, often in a belt round the thicker end, in the way of Shrikes' eggs, with deep rufous-brown spots and deeper lying paler grey or bluish-grey patches. They measure: 26×18.5 , 25.5×18.3 ; 24×18 , 24×18.2 , 23.5×18 , 26.8×17.6 ; 25×18.5 , 23.3×18 ; 25.6×18.6 , 25×18.6 , 25.7×18.5 ; 25.5×18.7 , 25×19 ; 25.6×18.6 , 26×18.5 , 26.5×18.5 ; 24.5×18.7 , 26×18.4 ; 25.3×19 , 25.5×18.7 , 25.3×18.6 ; 26.3×17.8 , 26.8×18 ; 25.3×18.8 , 23.8×18.2 , 24×18.6 , 25.3×19 ; 26×18 , 26.2×18 mm. The eggs of this *Pachycephala* agree therefore in character closely with those of other larger *Pachycephala*, and strikingly show the Laniine type, while those of *P. rufiventris* (*Lewinornis* Math.) and subspecies are smaller and much darker.

RHIPIDURA FLABELLIFERA.

(PELZELNI.)

NORFOLK ISLAND FANTAIL.

(PLATE 24.)

RHIPIDURA Vigors and Horsfield, Trans. Linn. Soc. (Lond.), Vol. XV., p. 246, Feb. 17th, 1827.

Type (by subsequent designation, Gray, 1840, p. 32): *Muscicapa flabellifera* Gmelin.

Rhipidicala Boie, Neues Staats Magazin (Schleswig), Vol. I., heft. ii, p. 489, 1832. Type (by subsequent designation, Mathews, List Birds Austr., p. 184, 1913): *Muscicapa flabellifera* Gmelin.

Rhipidicidura "Boie" Gray, Handl. Gen. Sp. Birds, Brit. Mus., pt. i., p. 330, (before Feb. 2nd) 1870, as synonym of *Rhipidura* Vigors and Horsfield.

MUSCICAPA FLABELLIFERA Gmelin, Syst. Nat., Vol. I., pt. ii., p. 934, April 20th, 1789: Dusky Sound, New Zealand.

Rhipidura assimilis Pelzeln, Sitzungsber. Ak. der Wiss., Vol. XLI., p. 320, 1860 (after June 8th): Norfolk Island. Not of Gray, Proc. Zool. Soc. (Lond.), 1858, p. 176.

Rhipidura pelzelni Gray, Ibis, July 1862, p. 226: Norfolk Island. New name for *assimilis* Pelzeln; Sharpe, Cat. Birds Brit. Mus., Vol. IV., p. 312, March 26th, 1879; Mathews, Handl. Birds Austr., p. 65, Jan. 1908.

Rhipidura flabellifera pelzelni Mathews, Nov. Zool., Vol. XVIII., p. 449, Jan. 1912; *id.*, List Birds Austr., p. 323, Dec. 1913; *id.*, Birds Austr., Vol. IX., pt. I., p. 16, Feb. 15th, 1921.

DISTRIBUTION. Norfolk Island.

Adult male. Entire upper-surface mouse-brown, darker on the top of the head; primaries similar in colour to the upper-parts; middle pair of tail-feathers brownish-ash with horn-coloured shafts, outer pair of tail-feathers brownish-ash, with the margin of the outer web white and broadly tipped at the extremity with white and with the shafts ivory-white; chin and upper throat white with the bases black; lower throat brownish-black; chest, breast and abdomen buffish; under wing-coverts, axillaries and under tail-coverts whitish. Bill black, eyes dark brown, feet black. Total length 143 mm.: culmen 7, wing 69, tail 80, tarsus 20. Figured. Collected at Steels Point, Norfolk Island, on the 30th of October, 1912.

Adult female. Similar to the adult male. Total length 138 mm.: culmen 7, wing 67, tail 78, tarsus 19. Collected at Steels Point, Norfolk Island, on the 11th of May, 1914.

Immature. Fore-head, head and back of the neck, dark greyish-brown; scapulars and back dark grey washed with brownish-chestnut; primaries and secondaries blackish-brown, slightly paler on the margins of the inner web; wing-coverts with large spots of pale buff at the extremity, forming a double wing-bar; middle pair of tail-feathers uniform blackish-brown, with shafts glistening black; remainder of the tail dark ash-brown, margined on both webs with greyish-white and broadly tipped with the same colour, shafts ivory-

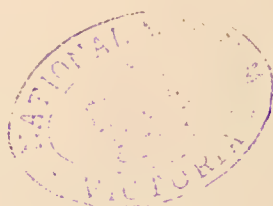


H. Grönvold, del.

Witherby & Co

RHIPIDURA PELZELNI
(NORFOLK ISLAND FANTAIL.)

RHIPIDURA CERVINA
(LORD HOWE ISLAND FANTAIL.)



NORFOLK ISLAND FANTAIL.

white ; chin, cheeks and throat greyish-white ; chest rust-colour, remainder of the under-surface light buff ; under wing-coverts and axillaries greyish-white. Bill black, eyes dark greyish-brown, feet yellowish-black. Collected at Dixey, Norfolk Island, on the 6th of February, 1913.

Nest and eggs. The six nests sent are all placed in forks of small branches (twigs), well woven round the twig, the tail-like appendage extending below or around the twig. They are composed of shreds of fine bark, decayed leaves, fine dry grass and spiders' webs, and sometimes decayed wood, lined inside with fine grass-stems and some horse-hairs. The clutches consist of 3 eggs, once there were 2, but this may be incomplete. The ground-colour is white or creamy-white, very slightly glossy, spotted, especially round the thick end, with dull rusty-rufous and a few deeper lying greyish patches. They measure : 16.5×13 , 16×13.4 , 16×12.7 ; 16.5×12.2 , 16.6×13 , 16.8×12.5 ; 16.3×12.1 , 16.3×12.5 , 16.5×12.5 ; 16.2×12.2 , 16×12.7 , 17.1×12.6 mm. The eggs were taken in November and December, one clutch on the 30th of October, 1912.

Breeding-season. October, November and December.

RHIPIDURA FLABELLIFERA.

(CERVINA.)

LORD HOWE ISLAND FANTAIL.

(PLATE 24.)

RHIPIDURA CERVINA Ramsay, Proc. Linn. Soc. (N.S.W.), Vol. III., p. 340, May 1879: Lord Howe Island.

Rhipidura cervina Ramsay, Proc. Linn. Soc. (N.S.W.), Vol. III., p. 340, May 1879; Mathews, Handl. Birds Austral., p. 65, Jan. 1908.

Rhipidura macgillivrayi Sharpe, Proc. Zool. Soc. (Lond.), Oct. 1st., 1881, p. 789, pl. 67: Lord Howe Island.

Rhipidura flabellifera cervina Mathews, Nov. Zool., Vol. XVIII., p. 449, Jan. 1912; *id.*, List Birds Austr., p. 323, Dec. 1913; *id.*, Birds Austr., Vol. IX., pt. I., p. 16, Feb. 15th, 1921.

DISTRIBUTION. Lord Howe Island.

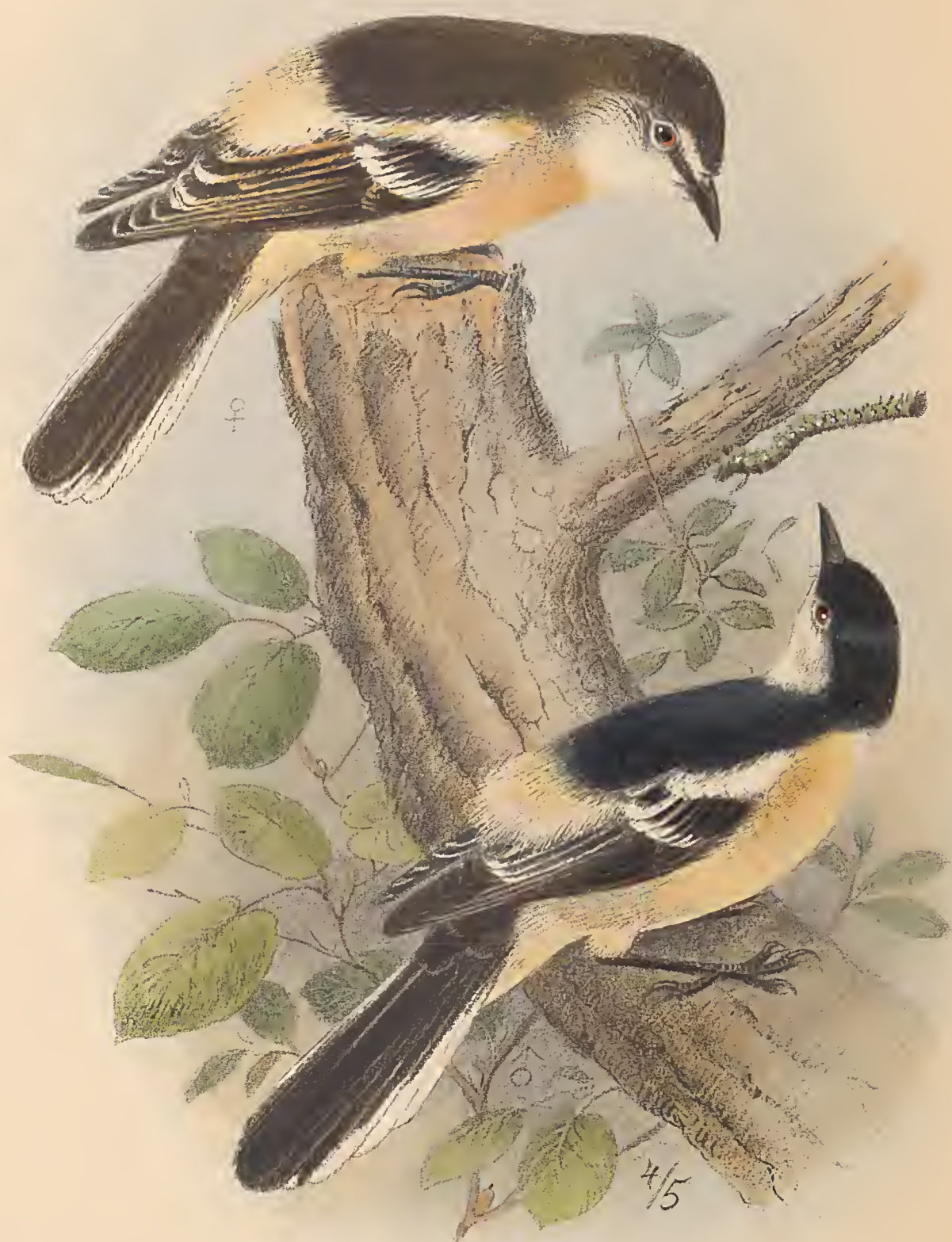
Adult female. Crown of head and back of neck dark olive-brown, slightly suffused with grey; scapulars, back and rump olive-brown, lightest on the rump; wing-coverts similar in colour to the back, but each feather rather broadly tipped with whitish-buff, forming a double wing-bar; primaries uniform blackish-brown; secondaries blackish-brown, the outermost ones margined with brownish-buff, the innermost ones more broadly margined with buff and whitish towards the extremity; the middle pair of tail-feathers uniform blackish-brown, the succeeding pairs ash-brown, lighter on the innermost margin, the outermost pairs margined on both webs with whitish-buff; chin and throat tawny white; remainder of the under-surface of the body chestnut-buff, brightest on the chest and palest on the under tail-coverts. Bill black, with lower base grey, eyes very dark brown, feet greyish-black. Total length 161 mm.: culmen 7, wing 72, tail 87, tarsus 21. Figured. Collected at the Pines, Lord Howe Island, on the 5th of May, 1914.

Adult male. Similar to the adult female. Total length 160 mm.: culmen 7, wing 74, tail 87, tarsus 21. Collected at the Pines, Lord Howe Island, on the 11th of May, 1914.

Immature. Fore-head whitish-grey; crown and back of the head dark grey, shafts paler; back of the neck dark grey; scapulars and back dark brown, washed with rust-colour, more pronounced on the lower back and rump; primary-quills uniform ash-brown; secondaries dark ash-grey, narrowly margined on the outer web with rust-red; wing-coverts similarly coloured to the wing, but with large spots of rust-red at the extremity forming a double bar; the middle pair of tail-feathers uniform brownish-black with black shafts, the remaining pairs ash-brown, shafts ivory-white; throat greyish-white; chest and upper breast rust-red; belly, vent and under tail-coverts white, tinged with pale buff; under wing-coverts and axillaries pale buff. Bill black with lower base grey, eyes brown, feet blue-grey. Collected at the Pines on the 27th of February, 1914.

Nest and eggs. The one nest is similar to those of *Rhipidura flabellifera pelzelni*, but still neater and smoother, the outside being beautifully covered with spiders' webs, and there are no horse-hairs in the lining. The eggs are also like those of *R. f. pelzelni* but average slightly larger, measuring: 17.1×12.7 , 16.5×13.6 ; 17.6×13.4 , 17.2×13.1 , 17.2×14 ; 16.5×13.5 , 16.8×14 , 17×13.5 ; 16×13.5 , 16.5×13.1 , 16.1×13.2 mm. They were taken from the 6th of October to the 18th of November, 1913.

Breeding-season. October and November.



H. Gronvold, del.

W. Herby & Co

DIAPHOROPTERUS LEUCOPYGUS
NORFOLK ISLAND CATERPILLAR — CATCHER.

DIAPHOROPTERUS LEUCOPYGUS.

NORFOLK ISLAND CATERPILLAR-CATCHER.

(PLATE 25.)

DIAPHOROPTERUS Oberholser, Proc. Acad. Philad., p. 214, June 2nd, 1899. Type (by original designation): *Symmorphus leucopygus* Gould.

Symmorphus Gould, Synops. Birds Austr. and Adj. Isl., pt. iv., App., p. 3, April 1838. Type (by monotypy): *Symmorphus leucopygus* Gould. Not Wesmaël, Mon. Odyn. Belg., 1833.

SYMMORPHUS LEUCOPYGUS Gould, Synops. Birds Austr. and Adj. Isl., pt. iv., App., p. 3, April 1838 : New South Wales error=Norfolk Island.

Symmorphus leucopygus Gould, Synops. Birds Austr. and Adj. Isl., pt. iv., App., p. 3, April 1838 ; Sharpe, Cat. Birds Brit. Mus., Vol. IV., p. 109, March 26th, 1879.

Campephaga longicaudata Pelzeln., Sitzungsab. Ak. der Wiss., Vol. XLI., p. 321, 1860 (after June 8th) : Norfolk Island.

Diaphoropterus leucopygius Mathews, Handl. Birds Austral., p. 68, Jan. 1908 ; *id.*, List Birds Austr., p. 323, Dec. 1913.

Lalage nævia leucopyga Mathews, Nov. Zool., Vol. XVIII., p. 449, Jan. 1912.

DISTRIBUTION. Norfolk Island.

Adult male. Crown of head, occiput and nape black, slightly glossed with oil-green ; scapulars and lower back glossy greenish-black ; feathers of the rump very dense and fluffy and creamy-white in colour ; upper tail-coverts dark grey ; lesser wing-coverts black ; median-coverts black, edged with white ; greater coverts white at the base and black on the terminal half, tipped with white ; primaries and secondaries black, white on the basal third and slightly margined on the outer web with white ; the three central pairs of tail-feathers black ; the outermost pairs black on the basal half and with the terminal half white ; feathers round the eye white and a white line running from the nostrils to the eye ; lores black ; sides of face, cheeks, chin and throat white ; sides of the neck white, fore-neck, chest, breast, abdomen, sides of the body and flanks rich creamy-buff ; under tail-coverts white, tinged with cream ; under wing-coverts and axillaries white. Bill black, eyes dark brown, feet black, tinged with greenish. Total length 185 mm. : culmen 11, wing 90, tail 86, tarsus 26. Figured. Collected at Mt. Pitt, Norfolk Island.

Adult female. Crown of head, occiput, nape and hind-neck, blackish-brown with hidden white spots ; scapulars and lower back brownish-black ; feathers of the rump very dense and fluffy, creamy-white in colour, tinged with rusty ; upper tail-coverts ash-grey ; lesser wing-coverts black ; median-coverts black tipped with white ; greater coverts white at the base and black on the terminal half ; quills brownish-black, white at the base of the inner web ; secondaries broadly margined with white and the primaries narrowly margined with rusty ; the middle pair of tail-feathers blackish-brown, the outer pairs black on the basal half and white on the terminal half ; lores whitish ; sides of the face, cheeks, ear-coverts, chin and throat white, slightly tinged with pale buff ; sides of neck, fore-neck, chest, breast, abdomen and sides of the body rich tawny-buff ; under tail-coverts pale

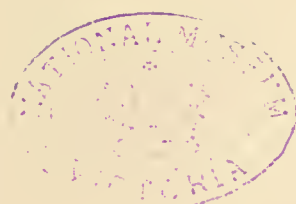
NORFOLK ISLAND CATERPILLAR-CATCHER.

isabelline-buff; under wing-coverts and axillaries white tinged with rosy. Bill black, eyes dark brown, feet bluish-black. Total length 192 mm. : culmen 12, wing 91, tail 86, tarsus 25. Collected at Dixey, Norfolk Island, on the 28th of April, 1913.

Immature male. Fore-head, crown of the head and occiput black, each feather broadly margined at the extremity with buff; back of the neck, scapulars and mantle deep blackish-brown, each feather tipped with whitish-buff; feathers of the rump very dense and white, slightly tinged with pale buff; upper tail-coverts brownish tipped with pale buff; primaries and secondaries blackish-buff, narrowly margined on the outer web with reddish-buff and with their bases white; the outer pair of tail-feathers for the greater part white, black at the base; the middle pair mostly black with a spot of white at the tip; chin, throat and sides of the neck white, with a very few indistinct spots of blackish-brown; fore-neck rich tawny-buff; remainder of the underparts including the under wing-coverts and axillaries white. Bill brownish-black, eyes blue-grey, feet greyish-black. Collected at Stockyard Creek, Norfolk Island, on the 31st of October, 1912.

Nest and eggs. The nests are placed in the forks of branches covered with the two lichens, *Usnea articulata* and *Parmelia perlata*. They consist of lichens, moss, thin stalks, fibres, cobwebs, small pieces of paper and threads of thin darning-wool, with no particular lining. They are rather flat. The eggs are 1 to 3 in number, and were found on the 23rd of October, 1912, 21st of November, 1912, and the 20th of December, 1912. They resemble eggs of the Australian *Lalage* and are pale green, slightly glossy, spotted and blotched, especially round the thick end, with deep rufous-brown and some paler deeper lying patches. They measure : 22×17 , 22.1×17.2 , 21×16.5 ; 22×17.6 ; 23×17 , 23×17.1 ; 22×17.5 , 22×17 , 22.5×17.2 ; 22×18 , 23×17.5 mm.

Breeding-season. October to December.





H. Gronvold, del.

Whitby & Co

TURDUS VINI'INCTUS
 (VINOUS - TINTED BLACKBIRD.)
 TURDUS POLIOCEPHALUS
 (GREY-HEADED BLACKBIRD)

TURDUS XANTHOPUS.

(VINITINCTUS.)

VINOUS-TINTED BLACKBIRD.

(PLATE 26.)

TURDUS Linné, Syst. Nat., 10th edn., Vol. I., p. 168, Jan. 1st, 1758. Type (by subsequent designation, Selby, Illustr. Brit. Birds, p. xxix., 1825): *Turdus merula* Linné (cf. Austral. Av. Rec., Vol. V., p. 77, Feb. 1923).

TURDUS XANTHOPUS Forster, Deser. Anim. ed. Licht., p. 266, 1844 (pref. Jan.): New Caledonia. Fig. Seebohm, Monogr. Thrushes, Vol. II., pl. 126.

Merula vinitincta Gould, Proc. Zool. Soc. (Lond.), 1855, p. 165, Dec. 18th: Lord Howe Island; *id.*, Suppl. Birds Austr., pt. ii., pl. 31, Sept. 1st. 1855; *id.*, Handb. Birds Austr., Vol. II., p. 529, Dec. 1865; Seebohm, Monogr. Thrushes, Vol. II., pl. 125, 1902; Mathews, Handl. Birds Austr., p. 72, Jan. 1908.

Turdus xanthopus vinitinctus Mathews, Nov. Zool., Vol. XVIII., p. 450, Jan. 1912.

Planesticus xanthopus vinitinctus Mathews, List Birds Austr., p. 324, Dec. 1913.

Planesticus xanthopus Mathews and Iredale, Austral. Av. Rec., Vol. IV., p. 109, Dec. 16th, 1920.

DISTRIBUTION. Lord Howe Island.

Adult male. Fore-head and crown of the head dark grey, suffused with olive; occiput, nape, hind-neck, scapulars, lower back, rump, upper tail-coverts and wing-coverts chestnut-brown; quills ash-brown, bordered on the outer web with olive-brown; tail-feathers uniform ash-brown; sides of the face, ear-coverts and cheeks like the crown; chin and throat brownish-olive; sides of the neck, fore-neck, chest, breast, abdomen, sides of the body, flanks, thighs and under tail-coverts, uniform vinous-chestnut, darkest on the under tail-coverts; under wing-coverts and axillaries brownish-olive; quills below ash-coloured. Bill yellow, eyes brown, feet light yellow. Total length 215 mm.: culmen 18, wing 108, tail 81, tarsus 32. Figured. Collected on Lord Howe Island.

Adult female. Similar to the adult male. Total length 215 mm.: culmen 18, wing 104, tail 80, tarsus 31. Collected at Cat Park, Lord Howe Island, on the 6th of October, 1913.

Immature. Head fulvous-brown with distinct buff shaft-streaks; back of the neck and mantle olive-brown, with buff shaft-stripes; lower back, rump and upper tail-coverts rich olive-brown; wing-coverts light brownish-olive, slightly margined with lighter olive; primary quills and secondaries brownish-ash, margined on the outer web with olive-brown; tail-feathers dark olive-brown; chin and throat rufous-olive; remainder of the under-surface of the body chestnut-buff, each feather with an indistinct blackish spot at the extremity; under wing-coverts and axillaries olive-brown; under aspect of wing brownish-ash. Bill greyish-yellow, eyes brown, feet greyish-yellow. Collected at the Pines, Lord Howe Island, on the 28th of February, 1914.

Younger birds are darker and have the shafts more noticeable.

Nest and eggs. No nests were sent, but clutches of 2 eggs (single eggs are probably incomplete clutches) and one of 3 were found on the 28th of September, and from the 5th and 7th of November to the 28th and 29th of December, 1913. The eggs resemble those of *Turdus fuliginosus*, but the majority are of the large-spotted type, and they average slightly larger, measuring: 28×22 , 29.5×22 ; 29×19.5 , 29.5×21 ; 30×20 , 30.7×20.6 ; 31×20.3 , 30.5×20.5 , 29×20 ; 31.5×21.5 ; 33×21 ; 31×21 ; 29.5×21.3 , 30.8×21.5 , 29×20 ; 29.6×21.3 , 30.7×21.3 ; 28.3×21.3 , 29×21.5 ; 29.7×20 mm. The majority of specimens are indistinguishable from eggs of *T. fuliginosus* from Norfolk Island.

Breeding-season. November and December.

TURDUS POLIOCEPHALUS.

GREY-HEADED BLACKBIRD.

(PLATE 26.)

TURDUS POLIOCEPHALUS Latham, Index Ornith. Suppl., p. XLIV., after May 30th, 1801 : Norfolk Island.

Ash-headed Thrush Latham, Gen. Synops. Birds, Suppl. ii., p. 373, 1801 : Norfolk Island.

Turdus poliocephalus Latham, Index Ornith. Suppl., p. XLIV., after May 30th, 1801.

Merula nestor Gould, Proc. Zool. Soc. (Lond.), 1835, p. 186, April 8th, 1836 : Norfolk Island ; Jardine and Selby, Illustr. Ornith., Vol. IV., pl. 37, pt. vii., 1840.

Merula poliocephala Gould, Birds Austr. Suppl., pt. iii., pl. 30, Sept. 1st, 1859 ; *id.*, Handb. Birds Austr., Vol. II., p. 528, Dec. 1865 ; Seebohm, Cat. Birds Brit. Mus., Vol. VIII., p. 258, Sept. 1881 ; *id.*, Monogr. Thrushes, pl. 105, 1902.

Merula fuliginosa Mathews, Handl. Birds Austr., p. 72, Jan. 1908. Not *Turdus fuliginosus* Latham, Index Ornith. Suppl., p. XLII., after May 30th, 1801, founded on the Sooty Thrush of Gen. Synops., Suppl. ii., p. 185, 1801, Watling drawing No. 147, indeterminable.

Turdus fuliginosus fuliginosus Mathews, Nov. Zool., Vol. XVIII., p. 450, Jan. 1912.

Planesticus fuliginosus Mathews, List Birds Austr., p. 324, Dec. 1913 ; Mathews and Iredale, Austral Av. Rec., Vol. IV., p. 110, Dec. 16th, 1920.

DISTRIBUTION. Norfolk Island.

Adult male. Fore-head, lores and crown of the head greyish-brown ; nape and hind-neck lighter than the crown ; scapulars, mantle, rump and upper tail-coverts very deep brownish-black with a slight gloss ; wing-coverts and primary-quills blackish-brown, shafts black ; tail uniform blackish-brown ; chin, throat, sides of the face and neck brownish-buff ; remainder of the under-surface deep brownish-black. Eyes dark brown, bill blackish-yellow, feet brownish-yellow. Total length 213 mm. : culmen 18, wing 113, tail 79, tarsus 32. Figured. Collected at Middlegate, Norfolk Island, on the 7th of June, 1913.

The sexes are alike.

Immature. Head blackish-brown with indistinct mesial shaft-stripes of dull buff ; a fluffy collar of reddish-brown feathers round the hind-neck ; mantle, back, rump and upper tail-coverts blackish-brown, tinged with dark olive ; scapulars darker ; wing-coverts brownish-olive ; primary-quills, secondaries and tail blackish-brown, tinged with olive on the outer web ; chin, throat and upper chest brownish-ash ; breast and abdomen dull reddish-chestnut ; sides of the body and flanks dark reddish-brown ; under tail-coverts blackish-brown, each feather with a broad mesial streak of white, widest at the tip ; under aspect of primary-quills brownish-ash. Bill brownish-yellow, eyes yellowish-brown, feet dark blackish-brown. Collected at Middlegate, Norfolk Island, on the 6th of March, 1913.

Younger. Head, back and wing-coverts brownish-chestnut, each feather with a narrow shaft-streak, whitish at the base and inclining to reddish at the extremity ; primary-quills brownish-ash with the shafts glistening black ; secondaries brownish-ash with the outer

GREY-HEADED BLACKBIRD.

web dark brownish-olive; tail-feathers like the primary-quills; lores chestnut-buff; ear-coverts blackish-brown, mesially streaked with fawn-colour; a spot behind the eye and on the sides of the neck chestnut-buff; chin and throat chestnut-buff with a line of blackish-brown down each side; chest, breast and sides of the body chestnut, each feather with buff shaft-streaks and with a blackish spot at the extremity; axillaries and under wing-coverts sooty; under tail-coverts brownish-buff, broadly streaked with white. Bill blackish-brown, eyes dark grey, feet dark dull brown. Collected near the Cascades, Norfolk Island, on the 8th of January, 1912.

Nest and eggs. The nests are large, fairly deep. Composed of stalks, fibres, dry leaves, grasses and lichens or moss, but *not* matted together with mud; lined with skeleton leaves and flat soft grasses. These birds seem to nest at various seasons. Most of the eggs were found from the 21st of September to the 23rd of December, but clutches were also taken on the 29th of April, 1912, 25th of April, 1913, and the 8th of May, 1913, and there is a young bird of the 20th of March. The clutches are of 2 or 3 eggs, in one case 4. Their ground-colour is greenish-white or pale green, sometimes creamish or pinkish-white. They are marked with smaller or larger rufous or brownish-red spots and patches, and some deeper lying pale bluish or pinkish-grey patches; one egg is pale blue, with the markings restricted to the thick end. The clutch of 4 is darker bluish and covered all over with small, pale, rufous spots, thus resembling eggs of the European Blackbird or Redwing, while the majority of the others resemble those of the Mistle Thrush, except that the latter are larger. The eggs measure: 32.2×20 , 34×20 (the most elliptical clutch); 32×20.5 , 31.5×21.6 ; 29.5×22.1 , 28.5×22 ; 29.5×22 , 30×22.7 ; 27.5×21 , 28.3×20.3 ; 29.2×21 , 29.1×21 , 28.5×21 ; 30×21 , 29×20.6 ; 28.6×21 , 29.6×21.3 ; 29.3×22.7 , 30.5×23 ; 28.5×20.6 , 28.5×21 ; 29.5×20.3 , 29.8×20 , 29.8×20 , 29×20.1 (the green Blackbird-like clutch); 28×21 , 28.7×21 ; 28.6×21.4 , 28.2×21 ; 31.5×21 , 31×21 ; 32.7×22.3 , 30.6×21.3 , 28.5×20.5 ; 29×21 , 30.5×21.8 ; 30×22 , 29×22 ; 30×21.7 , 28×21 ; 28.6×20 , 27.3×20 , 28.3×20.5 ; 30×21 , 27×21 ; 29×21.3 , 29.5×21.5 ; 28×22 , 28×21.5 mm.

Breeding-season. September to December, April and May.

ZOSTEROPS LATERALIS.

(TEPHROPLEURA.)

LORD HOWE ISLAND WHITE-EYE.

(PLATE 27.)

ZOSTEROPS Vigors and Horsfield, Trans. Linn. Soc. (Lond.), Vol. XV., p. 234, Feb. 17th, 1827.

Type (by monotypy): *Zosterops dorsalis* Vigors and Horsfield = *Sylvia lateralis* Latham.

Luteozosterops Mathews, Austral. Av. Rec., Vol. V., pts. 2-3., p. 36, Feb. 21st, 1923. Type (by original designation): *Zosterops albeventris cairncrossi* Mathews.

SYLVIA LATERALIS Latham, Index Ornith., Suppl. LV., after May 30th, 1801: Sydney, New South Wales.

Rusty-sided Warbler Latham, General Synops. Birds, Suppl. ii., p. 250, 1801: New South Wales (fig. Gould, Birds Austr., Vol. IV., pl. 81 (pt. XI.), June 1st, 1843; Mathews, Birds Austr., Vol. XI., pt. 3, pl. 505, Dec. 27th, 1923).

Zosterops tephropleura Gould, Proc. Zool. Soc. (Lond.), 1855, p. 166, Dec. 18th: Lord Howe Island: *id.*, Birds Austr. Suppl., pl. 49, pt. 2, Sept. 1st, 1855; *id.*, Handb. Birds Austr., Vol. II., p. 538, Dec. 1865; Mathews, Handl. Birds Austral., p. 90, Jan. 1908; Mathews and Iredale, Austral. Av. Rec., Vol. IV., p. 109, Dec. 16th, 1920.

Zosterops lateralis tephropleura Mathews, Nov. Zool., Vol. XVIII., p. 386, Jan. 1912.

DISTRIBUTION. Lord Howe Island.

Adult male. Head, nape, hind-neck, mantle and scapulars dark ash-grey; rump, upper tail-coverts and wing-coverts bright olive-green, lightest on the upper tail-coverts; primary-quills and tail ash-grey, margined on the outer web with olive-green; fore-head and lores dark olive-green; feathers round the eye white, bordered below with dusky; sides of face, cheeks, ear-coverts, chin and throat sulphur-yellow; chest, breast, abdomen, sides of the body and flanks isabelline-buff; under tail-coverts bright lemon-yellow; under wing-coverts and axillaries white; quills below ash-grey, lighter on the inner web. Bill black, with lower base blue-grey; eyes light brown, feet light blue-grey. Total length 132 mm.: culmen 11, wing 61, tail 50, tarsus 19. Figured. Collected at the Pines, Lord Howe Island, on the 5th of May, 1914.

Adult female. Similar to the adult male. Total length 129 mm.: culmen 10, wing 59, tail 50, tarsus 19. Collected at the Pines, on the 11th of May, 1914.

Eggs. A clutch of two eggs, found on the 11th of January, 1914, on Lord Howe Island, was sent. The eggs are in size between those of *lateralis* and *tenuirostris* and measure 28.6×15 and 29.4×15.2 mm. The colour is of course the same as that of the other forms.

Breeding-season. January.

Page 50.

LORD HOWE ISLAND WHITE-EYE.—*Correction.*

Add the word “green” as follows:—

Line 1 of the description, after “hind-neck” (reading Head, nape, hind-neck green; mantle and scapulars dark ash-grey).

Line 5, after “ear-coverts” (reading sides of face, cheeks, ear-coverts green; chin and throat sulphur-yellow).



H. Grönvold, del.

Witherby & Co

ZOSTEROPS TEPHROPLEURA
(LORD HOWE ISLAND WHITE-EYE)

NESZOSTEROPS STRENUA
(ROBUST WHITE-EYE)

NESZOSTEROPS TENUIROSTRIS
(SLENDER-BILLED WHITE-EYE)

NESZOSTEROPS ALBOGULARIS
(WHITE-BREADED WHITE-EYE)

NESOZOSTEROPS ALBOGULARIS

WHITE-BREASTED WHITE-EYE.

(PLATE 27.)

NESOZOSTEROPS Mathews, Nov. Zool., Vol. XVIII., p. 451, Jan. 31st, 1912. Type (by original designation): *Zosterops strenua* Gould.

ZOSTEROPS ALBOGULARIS Gould, Synops. Birds Austr. and Adj. Isl., pt. 1, pl. 18, Jan. 1st, 1837 : Murrumbidgee River error=Norfolk Island.

Zosterops albugularis Gould, Synops. Birds Austr. and Adj. Isl., pt. 1, pl. 18, Jan. 1st, 1837 ; *id.*, Proc. Zool. Soc. (Lond.), 1836, p. 75, Jan. 16th, 1837 ; *id.*, Birds Austr. Suppl., pt. 3, pl. 46, Sept. 1st, 1859 ; *id.*, Handb. Birds Austr., Vol. II., p. 535, Dec. 1865 ; Sharpe, Cat. Birds Brit. Mus., Vol. IX., p. 154, 1884 (pref. Feb. 11th) ; Mathews, Handl. Birds Austral., p. 90, Jan. 1908 ; *id.*, Nov. Zool., Vol. XVIII., p. 450, Jan. 1912.

Zosterops gularis "Gould" Lesson, Rev. Mad. de Zool., 1840 (for May), p. 135, error only.

Nesozosterops albugularis Mathews, List Birds Austr., p. 324, Dec. 1913 ; Mathews and Iredale, Austral. Av. Ree., Vol. IV., p. 110, Dec. 16th, 1920.

DISTRIBUTION. Norfolk Island.

Adult male. Fore-head, crown of the head, occiput and nape bright greenish-olive ; lores black, feathers surrounding the eyes white ; scapulars, lower back and rump olive-brown ; upper tail-coverts greenish-olive ; wing-coverts dark olive-green ; quills ash-brown, margined on the outer web with greenish-olive ; the outer pair of tail-feathers uniform ash-brown, remainder margined on the outer web with dark olive-green ; chin, throat, sides of neck and fore-neck white, suffused with pale buff, bordered down the sides with dark grey ; chest, breast and abdomen creamy-white ; sides of body, flanks and thighs dark umber-brown ; under tail-coverts primrose-yellow ; under wing-coverts and axillaries pure white ; quills below ash, widely margined on the inner web with white. Bill black, lower base grey, eyes light brown, feet blue-grey. Total length 142 mm. : culmen 14, wing 76, tail 54, tarsus 23. Figured. Collected at Middlegate, Norfolk Island, on the 7th of June, 1913.

Adult female. Differs only in having green instead of black lores. Total length 140 mm. : culmen 13, wing 76, tail 56, tarsus 22. Collected near Kingston, Norfolk Island, on the 25th of April, 1913.

Nest and eggs. The nest is suspended in a fork of a twig, the cup not very deep. It is composed of rootlets and dry stalks of grasses and lined with fine grass-stalks and a few horse-hairs. Sometimes some cocoons, cobwebs, feathers, and other materials are added on the outside. Two eggs each were found in October, November and December. The rather large eggs are like those of other species of the genus, pale blue with little gloss. They measure : 21.6×15 , 22.3×16.5 ; 23.5×15.6 , 23.3×16 ; 23×16.3 , 22.5×16 ; 22×15.6 , 21×15.6 ; 23.5×16.1 , 23×16 ; 22.5×16.5 , 22.5×16.1 ; 22×16.5 , 21.6×16.5 ; 22.2×16.6 mm.

Breeding-season. October to December.

NESOZOSTEROPS TENUIROSTRIS.

SLENDER-BILLED WHITE-EYE.

(PLATE 27.)

ZOSTEROPS TENUIROSTRIS Gould, Synops. Birds Austr. and Adj. Isl., pt. 1, pl. 18, Jan. 1st, 1837 :
Murrumbidgee River error=Norfolk Island.

Zosterops tenuirostris Gould, Synops. Birds Austr. and Adj. Isl., pt. 1, pl. 18, Jan. 1st, 1837 ; *id.*,
Proc. Zool. Soc. (Lond.), 1836, p. 76, Jan. 16th, 1837 ; *id.*, Birds Austr. Suppl., pt. iii.,
pl. 47, Sept. 1st, 1859 ; *id.*, Handb. Birds Austr., Vol. II., p. 536, Dec. 1865 ; Sharpe, Cat.
Birds Brit. Mus., Vol. IX., p. 154, 1884 (pref. Feb. 11th) ; Mathews, Handl. Birds Austral.,
p. 90, Jan. 1908 ; *id.*, Nov. Zool., Vol. XVIII., p. 450, Jan. 1912.

Nesozosterops tenuirostris Mathews, List Birds Austr., p. 324, Dec. 1913 ; Mathews and Iredale,
Austral Av. Rec., Vol. IV., p. 110, Dec. 16th, 1920.

DISTRIBUTION. Norfolk Island.

Adult male. Top of the head, occiput, nape and hind-neck dark olive-green ; lores yellow ;
feathers round the eye white, encircled with black ; sides of the face, ear-coverts and
cheeks bright olive-green ; scapulars, lower back and rump olive-brown ; rump, upper
tail-coverts and wing-coverts olive-green ; primary-quills ash, narrowly margined on the
outer web with olive-green ; tail-feathers brownish-ash, narrowly margined on the outer
webs with olive-green ; chin and throat bright sulphur-yellow ; sides of the neck and
fore-neck olive-yellow ; chest, breast and abdomen pale primrose-yellow ; sides of body,
flanks and thighs dark grey, suffused with yellow ; under tail-coverts primrose-yellow ;
under wing-coverts and axillaries white ; quills below grey, widely margined on the inner
web with white. Bill dark horn, with lower base light horn, eyes bright brown, feet
bluish-grey. Total length 137 mm. : culmen 12, wing 70, tail 53, tarsus 23. Figured.
Collected near Kingston, Norfolk Island, on the 29th of April, 1913.

Adult female. Similar to the adult male. Total length 123 mm. : culmen 12, wing 67, tail 50,
tarsus 23. Collected at the Cascades, Norfolk Island, on the 11th of June, 1913.

Nest and eggs. The nests are built like those of *Z. albogularis* but smaller. From 2 to 4 eggs were
found from the 25th of November to the 20th of December, 1912. The eggs are similar to
those of *Z. albogularis* but smaller. They measure : 20.2×14.5 , 20.4×15.4 ,
 20.5×15.5 , 20×14.8 ; 20.5×14.8 , 20.3×14.6 , 20.5×15.5 , 20.1×15.1 ; 20.5×15 ,
 20.6×15.5 ; 21.5×15 , 20.5×15 ; 20×15.5 , 20×15.6 ; 19.9×15 ; 20×15 ;
 20.5×15.4 , 20×15.2 , 20.4×15.4 ; 19.9×15.1 , 20.1×15.2 ; 19.6×16.1 , 20×16 ,
 20×15.8 , 20×16.3 ; 20.5×13.5 , 21×15 , 19.5×15 mm.

Breeding-season. November and December.

NESOZOSTEROPS STRENUA.

ROBUST WHITE-EYE.

(PLATE 27.)

ZOSTEROPS STRENUA Gould, Proc. Zool. Soc. (Lond.), 1855, p. 166, Dec. 18th : Lord Howe Island.

Zosterops strenua Gould, Proc. Zool. Soc. (Lond.), 1855, p. 166, Dec. 18th ; *id.*, Birds Austr. Suppl., pt. ii., pl. 48, Sept. 1st, 1855 ; *id.*, Handb. Birds Austr., Vol. II., p. 537, Dec. 1865 ; Sharpe, Cat. Birds Brit. Mus., Vol. IX., p. 155, 1884 (pref. Feb. 11th) ; Mathews, Handl. Birds Austral., p. 90, Jan. 1908 ; *id.*, Nov. Zool., Vol. XVIII., p. 450, Jan. 1912.

Nesozosterops strenua Mathews, List Birds Austr., p. 324, Dec. 1913.

DISTRIBUTION. Lord Howe Island.

Adult male. Fore-head, crown of head, nape and hind-neck yellowish-green ; lores bright yellowish-green ; feathers round the eye white, below which is a dusky patch ; sides of face, cheeks and ear-coverts bright yellowish-green ; chin, throat and lower neck sulphur-yellow ; chest, breast, abdomen, sides of the body and flanks creamy-white ; under tail-coverts light sulphur-yellow ; under wing-coverts and axillaries white ; quills below ash-grey inclining to whitish on the margins of the inner web. Bill black, with lower base blue-grey, eyes light brown, feet light blue-grey. Total length 155 mm. : culmen 18, wing 71, tail 54, tarsus 25. Figured. Collected at the Pines, Lord Howe Island, on the 31st of October, 1913.

Adult female. Similar to the above. Total length 150 mm. : culmen 15, wing 67, tail 52, tarsus 23. Collected at the Pines on the 24th of November, 1913.

Nest and eggs. The nests are considerably smaller than those of *Z. albogularis* and *tenuirostris* and built of finer material ; two of them contain a great amount of sheeps' wool ; one, skeleton leaves. The cup seems to be comparatively deeper. Two to three eggs were found on the 6th of November, 8th of December, and 31st of December, 1912. They are very much smaller than those of *Z. tenuirostris* and measure : 18.3×12.3 , 18.7×13 , 17.2×12.8 , 16.8×12.7 , 16.6×12.7 , 18.2×12.7 , 18×13.5 , 17.1×12.7 , 13.1×12.7 mm.

Breeding-season. November and December.

APLONIS FUSCUS.

(FUSCUS.)

NORFOLK ISLAND STARLING.

(PLATE 28.)

APLONIS Gould, Proc. Zool. Soc. (Lond.), 1836, p. 73, Oct. 18th. Type (by subsequent designation, Gray, 1840, p. 40): *Aplonis fuscus* Gould.

APLONIS FUSCUS Gould, Proc. Zool. Soc. (Lond.), 1837, p. 73, Oct. 18th: Murrumbidgee River error=Norfolk Island.

Aplonis fuscus Gould, Proc. Zool. Soc. (Lond.), 1836, p. 73, Oct. 18th: Murrumbidgee River error=Norfolk Island; Sharpe, Cat. Birds Brit. Mus., Vol. XIII., p. 133, 1890 (pref. May 14th); Mathews, Handl. Birds Austral., p. 104, Jan. 1908; Mathews and Iredale, Austral Av. Rec., Vol. IV., pp. 109-110, Dec. 16th, 1920.

Aplonis fuscus fuscus Mathews, Nov. Zool., Vol. XVIII., p. 451, Jan. 1912: *id.*, List Birds Austr., p. 325, Dec. 1913.

DISTRIBUTION. Norfolk Island.

Adult male. Crown of the head, occiput, nape, hind-neck and lores, dark grey, glossed with bottle-green; scapulars, lower back, rump, upper tail-coverts and wing-coverts dark grey, glossed with dull bottle-green; primary-quills dark ash-brown with black shafts; cheeks, chin and throat blackish-grey, glossed with bottle-green; sides of the neck, fore-neck, chest, breast, abdomen, sides of the body, flanks, thighs and under tail-coverts dark grey, tinged with blackish, producing a sooty appearance; under wing-coverts and axillaries dark ash-grey; quills below ash-grey, with the inner margins greyish-buff. Bill black, eyes reddish-orange, feet black, slightly tinged with grey. Total length 196 mm.: culmen 13, wing 103, tail 68, tarsus 25. Figured. Collected at the Cascades, Norfolk Island, on the 28th of May, 1913.

Adult female. Crown of head, occiput, nape, hind-neck, fore-head and lores dark grey, glossed with bottle-green; scapulars, lower back, rump, upper tail-coverts, wing-coverts, primary-quills and tail-feathers uniform dark ash-grey; sides of face, ear-coverts, cheeks, chin and throat dark greyish-ash, very faintly glossed with dull green; sides of the neck, fore-neck and chest dark greyish-ash, faintly tinged with fawn-colour; breast, abdomen, sides of the body, flanks and thighs yellowish fawn-colour; under tail-coverts yellowish-white; under wing-coverts and axillaries white, tinged with grey; quills below dark ash, margined on the inner web with greyish-buff. Bill black, eyes light orange, feet greyish-black. Total length 198 mm.: culmen 13, wing 98, tail 63, tarsus 25. Collected at the Cascades on the 15th of April, 1913.

Young bird. Fore-head and crown dark greyish-black; back of the neck and upper mantle dark grey, with whitish shaft-streaks to the feathers, producing a striated appearance; lower mantle, back, rump and upper tail-coverts dark grey; wing-coverts, primaries, secondaries and tail like the back; throat, sides of the neck, chest and upper breast leaden-grey, with very indistinct whitish shaft-streaks; lower breast, belly, sides of the body and under tail-coverts light buff; under wing-coverts and axillaries buffish-white; under-surface of wings ash, becoming whiter towards the margins of the inner webs. Bill black, eyes greenish-yellow, feet blackish-grey. Collected at the Cascades on the 4th of April, 1913.

Nest and eggs. The nest is built of sticks and lined with dry leaves. The eggs are like those of other species of the genus and allies, pale blue with rufous spots. Four clutches of 2 and 3 eggs were taken on the 23rd of November, 25th of November, 8th of December and the 21st of December, 1912. They measure: 26.1×19 , 25.5×17.5 , 25×18 ; 26.6×18.6 , 25.5×19.3 , 25.5×18.7 ; 26×18 , 26×19 ; 26×19.1 , 27.2×18.7 mm.

Breeding-season. November and December.



H. Grönvold. del

APLONIS FUSCUS
(NORFOLK ISLAND STARLING)

Witherby & Co

APLONIS FUSCUS.
(HULLIANUS.)

LORD HOWE ISLAND STARLING.

APLONIS FUSCUS HULLIANUS Mathews, Nov. Zool., Vol. XVIII., p. 451, Jan. 31st, 1912: Lord Howe Island.

Aplonis fuscus hullianus Mathews, Nov. Zool., Vol. XVIII., p. 451, Jan. 31st, 1912; *id.*, List Birds Austr., p. 325, Dec. 1913.

DISTRIBUTION. Lord Howe Island.

Adult male. Fore-head, crown of head, occiput, nape, hind-neck, lores, eyebrow, sides of face, ear-coverts, cheeks, chin, throat and chest blackish-brown, strongly glossed with bottle-green; scapulars, lower back, rump and upper tail-coverts grey, faintly glossed with green; wing-coverts brownish-ash, each feather margined with dull greenish-grey; primary-quills ash-brown, shafts black; tail-feathers ash-brown with the shafts reddish-brown; breast, abdomen, sides of the body, flanks, thighs and under tail-coverts olive-grey, lightest on the under tail-coverts; under wing-coverts and axillaries light grey; quills below ash-brown becoming lighter towards the inner web. Bill black, eyes orange, feet black. Total length 200 mm.: culmen 15, wing 105, tail 71, tarsus 28. Figured. Collected at the Pines, Lord Howe Island, on the 5th of May, 1914.

Adult female. Fore-head, crown of head, occiput, nape, hind-neck, lores, sides of the face, ear-coverts, cheeks, chin and throat light ash-grey, faintly glossed with dull green; scapulars, back, rump, and wing-coverts ash-grey; primary-quills ash-brown, very narrowly margined with whitish; tail-feathers ash-brown; sides of the neck, fore-neck, chest and breast, like the upper-surface, but rather lighter; abdomen, sides of the body, flanks and thighs isabelline-buff, brighter on the abdomen; under tail-coverts yellowish-white; under wing-coverts and axillaries greyish-white; quills below ash-brown, becoming tawny towards the inner web. Bill black, eyes dark orange, feet black. Total length 204 mm.: culmen 14, wing 98, tail 68, tarsus 27. Collected at Cat Park, Lord Howe Island.

Eggs. Two clutches of 3 eggs were taken on the 10th of October and 3rd of November, 1913. They are a little larger and mostly a shade darker, but otherwise exactly like those of *A. fuscus fuscus*. They measure: 27×19 , 27.3×20 , 27.6×19.5 ; 28.7×19.6 , 29.5×19.9 , 29.9×20 mm.

STREPERA GRACULINA.

(CRISSALIS.)

LORD HOWE ISLAND CROW SHRIKE.

(PLATE 29.)

STREPERA Lesson, *Traité d'Ornith.*, livr. V., p. 329, Dec. 1830. Type (by tautonymy): *Coracias strepera* = *Corvus graculina* White.

Coronica Gould, *Synops. Birds Austr. and Adj. Isl.*, pt. i., pl. 5, Jan. 1st, 1837. Type (by subsequent designation, Selby, *Cat. Gen. and Subgen. Types Aves.*, p. 16, 1840): *Coronica fuliginosa* Gould.

Neostrepera Mathews, *Austral. Av. Rec.*, Vol. I., pt. 8, p. 196, March 20th, 1913. Type (by original designation): *Strepera arguta* Gould.

CORVUS GRACULINUS White, *Journ. Voyage New South Wales*, p. 251 and pl., before Aug. 1790: Sydney, New South Wales (fig. Gould, *Birds Austr.*, Vol. II., pl. 42 (pt. xv.), June 1st, 1844; Mathews, *Birds Austr.*, Vol. X., pt. 6, pl. 488, June 5th, 1923.

Strepera crissalis Sharpe, *Cat. Birds Brit. Mus.* Vol. III., p. 58, pl. 2, 1877 (pref. June).

Strepera graculina crissalis Mathews, *Nov. Zool.*, Vol. XVIII., p. 451, Jan. 1912; *id.*, *List Birds Austr.*, p. 325, Dec. 1913.

DISTRIBUTION. Lord Howe Island.

Adult male. Crown of head, occiput, nape, hind neck and mantle black, slightly glossed with steel-blue, all the shafts of the feathers glistening black, rump and upper tail-coverts duller; first and second primary-quills uniform black, remaining primaries black with the basal third pure white; tail-feathers black, broadly tipped with white and with the basal two-thirds white; throat, sides of neck, fore-neck, chest and breast black, with the shafts glistening black; abdomen, sides of body, flanks and thighs black tinged with dark grey; under tail-coverts white; under wing-coverts and axillaries like the chest. Bill black; feet black; iris orange. Total length 520 mm.; culmen 62; wing 254; tail 203; tarsus 55. Collected at Little Slope, Lord Howe Island, on the 24th of March, 1914.

Sexes are alike.

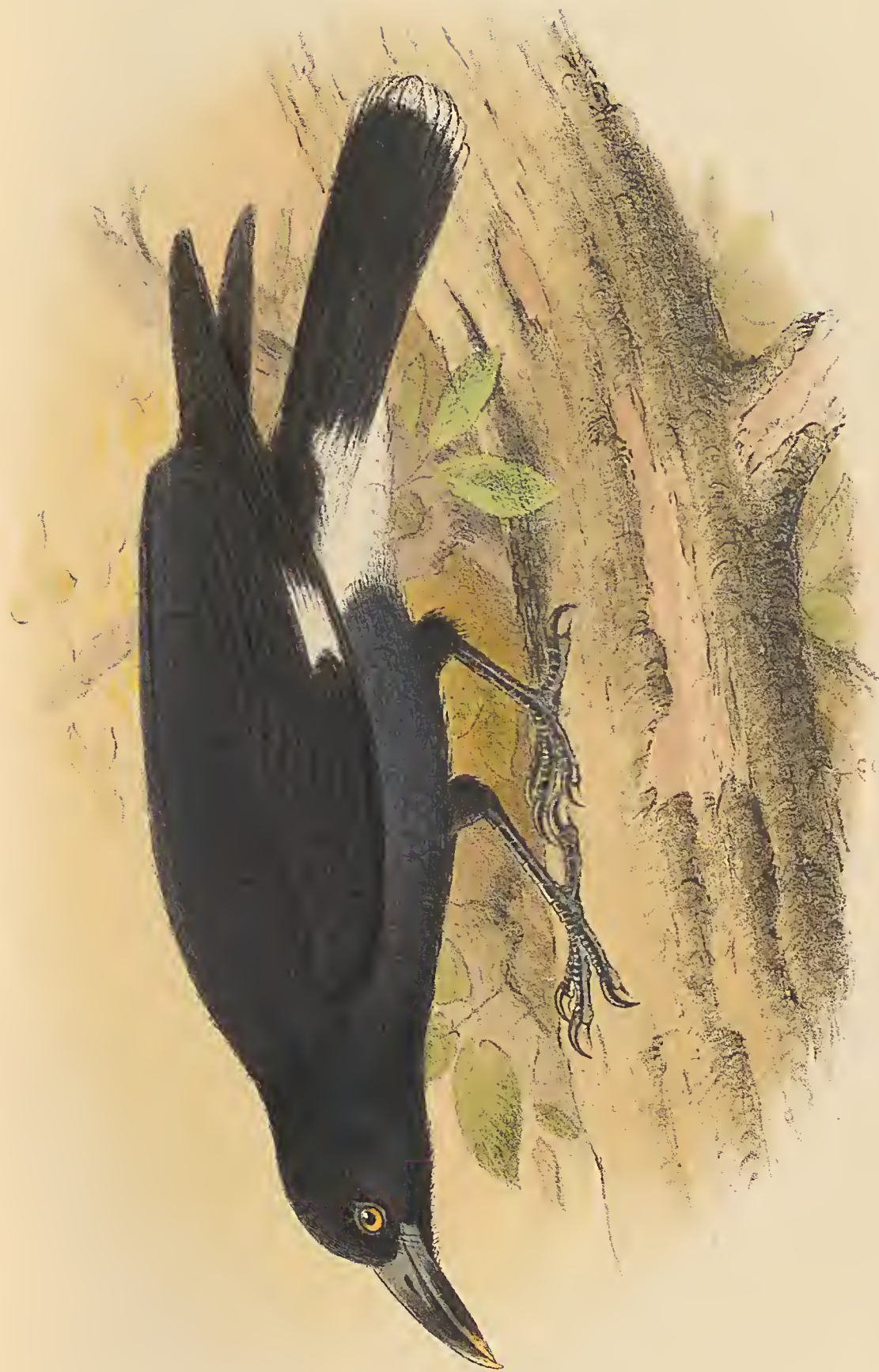
Eggs. Clutches of 3 eggs each were found on the 22nd, 24th and 25th of October, one of two on the 28th of October, 1913. The eggs are typical *Strepera* eggs. They have a somewhat thin shell and are only faintly glossy. The ground-colour varies from pale drab to raw umber or almost rufous, spotted and splashed with greyish umber and brown, sometimes faintly. They measure: 41.8 × 31.5, 41.8 × 30.5, 42.5 × 31; 39.1 × 28.7, 40 × 28.5; 42.7 × 30. 39.1 × 30, 44 × 29.7; 42.5 × 29.5, 40 × 29, 42.7 × 29; 42.7 × 31.7 mm.

Breeding-season. October.

Witherby & Co

STREPERA CRISSALIS
(*LORD HOWE ISLAND CROW - SHRIKE*)

H. Grönvold, del.



BIRDS OF THE
AUSTRALASIAN SOUTH POLAR QUADRANT
AND ADDITIONS TO
“THE BIRDS OF AUSTRALIA”



H. Grönvold, del

Witherby & Co

APTENODYTES FORSTERI
(EMPEROR PENGUIN.)

APTENODYTES PATAGONICA
(KING PENGUIN.)

APTENODYTES PATAGONICA.
(HALLI.)

KING PENGUIN.

(PLATE 30.)

APTENODYTES Miller, Var. Subj. Nat. Hist., 1778, pt. iv., pl. 23. Type (by monotypy):
Aptenodytes patagonica Miller.

Apterodita Scopoli, Dcl. Flor. et Faun. Insub., Vol. II., pt. II., p. 91, 1786: new name for
Aptenodytes.

Pinguinaria Shaw, Mus. Lever., Vol. I., pt. III., p. 144 (pl. dated July 2nd), Nov. 22nd,
1792: new name for *Aptenodytes*.

APTENODYTES PATAGONICA Miller, Var. Subj. Nat. Hist., 1778, pt. iv., pl. 23: Falkland
Islands (fig., "Voy. Erebus and Terror," pl. 32).

Aptenodytes patagonica halli Mathews, Birds Austr., Vol. I., p. 272, Oct. 31st, 1911: Macquarie
Island.

Aptenodytes patagonica Ewing, Tasm. Journ. Nat. Sci., Vol. I., pt. I., 1841: Tasmania;
Ogilvie-Grant, Cat. Birds Brit. Mus., Vol. XXVI., p. 627, 1898 (pref. Sept. 30th);
Wilson, Nat. Antarct. Exped., Vol. II., Aves, p. 32, pl. VIII., 1907; Mathews and
Iredale, Manual Birds, p. 13, pl. I., March 9th, 1921; Mathews, Syst. Av. Australas.,
p. 9, 1927.

Aptenodytes patagonica halli Mathews, Birds Austr., Vol. I., p. 272, Oct. 31st, 1911; *id.*, List
Birds Austr., p. 3, Dec. 1913; *id.*, Syst. Av. Australas, p. 9, 1927.

DISTRIBUTION. Macquarie Island (breeding), New Zealand and Antarctic Seas, Tasmania
(casual).

Adult male. General colour of the upper-surface bluish-grey, the feathers dusky at the base,
with black shaft-streaks and greyish-white spots more or less surrounded with black;
the shaft-streaks more pronounced on the upper tail-coverts; the sides of the neck
greyish-white; head, sides of the face, throat, and a line on each side of the breast black,
with a greenish gloss on the throat, a patch of orange on the hinder part of the head,
which is continued in a narrow line and joined to the somewhat deeper-coloured orange
of the fore-neck; remainder of the upper-surface creamy-white, becoming pure white
on the lower abdomen; flippers dark grey above, under-surface white, margined and
tipped with bluish-grey. Upper mandible and tip of lower black, base of lower mandible
sealing-wax red, shading into lead-grey towards the tip; eyes brown, with dark radial
streaks; feet and claws black. The pupil at all ages is quadrilateral or diamond-shaped
when contracted, and becomes circular when dilated to its full extent. Total length
966 mm.: culmen 122, flipper 280, middle toe and claw 112.

BIRDS OF THE AUSTRALASIAN SOUTH POLAR QUADRANT.

Adult female. Similar to the adult male, but the colour on the base of the lower mandible not so pronounced.

Immature. The general appearance of the upper-surface is lighter; the patch of orange in the adult is of a pale lemon-colour; the crown is distinct from the rest of the black head as a diamond-shaped patch of pearly bluish-grey. The upper mandible and tip of lower black; lower bluish-black shading into a bright-red tinge at the base. Eyes brown, with darker radial streaks, feet and claws black.

Young covered in brownish down. The upper mandible purplish-black; lower purplish-black with a patch half an inch long of pale whitish horn-colour on each side, about the middle of its length; eyes grey with a brown tint, streaked radially with darker brown; eyelids and skin around the eyes dusky-purple; feet and claws black.

Nest. None made, the egg being placed on the bare ground, and incubated in the loose fold of abdominal skin, where the egg is held in position by the feet.

Egg. Clutch one; ground-colour pale greenish-white, covered wholly or in part with a thin calcareous matter; tapering suddenly from the diameter to the tip. 96-106 mm. by 71-78 mm.

Breeding-season. November (Macquarie Island).

ALTHOUGH I described and worked up this bird in the first volume of my *Birds of Australia* I did not figure it. I have now done so, and from Wilson's account of its habits I have taken the following.

Macquarie Island lies about 600 miles S.W. of New Zealand, and we made our landing on the east side, anchoring in Fisherman's Cove. The shore is belted by a thick fringe of kelp, and the eastern slopes of the island are covered with a coarse tussock grass, which grows breast high. Between the foot of the hills at this point and the seashore is an extensive beach and a stretch of stony quagmire, with patches of tussock here and there, and it was in this quagmire that the King Penguin rookery was situated.

On November 22nd, 1901, there was in the King Penguin's rookery a large number of birds busily incubating eggs. These, as is well known, they hold upon their feet, tucked in between the legs and covered from sight by a loose fold of skin and feathers, and so tightly were they held that although we lifted the birds bodily from the ground, yet the egg was very seldom dropped. The object of thus holding the egg is to keep it from the wet and muddy quagmire in which the birds prefer to incubate; a parallel case to the Emperor Penguin, where the object is to keep the egg from contact with the ice.

During the incubation the egg is simply held wedged in between the legs, resting upon the upper surface of the feet. There is no pouch.

The rookery was filthy, neither more nor less, and the whole area smelt abominably. They are large birds, and hundreds are huddled together in close companies, living and breeding on an area of mud, stones and water at the foot of the overhanging hills. The breeding birds avoid the tussock

KING PENGUIN.

grass, amongst which one finds only bands of bachelors and unemployed. Generally, the sitting bird makes an effort to keep clean and dry by balancing itself on a stone, a little island as it were, in the muddy trickle that surrounds it. Several birds taken with eggs, and marked on the spot as sitters, proved, on examination, to be males, so that probably the parents take turns, one sitting while the other goes to sea to feed.

There were birds in this rookery of all sexes, ages and conditions, a few adults even in full moult. Many of the young were still in a complete suit of chestnut-coloured down, although almost as big as the adults; many showed different stages of the natal moult, shaggy remnants of the down, commonly as collars only or tufts on the neck, breast and back, remaining still *in situ*; many showed the clean pale feathers of immaturity, the neck being smaller and of a very pale lemon-yellow instead of orange-gold, the bright red side plates of the mandible being less conspicuous by its absence.

Of the eggs, some were well advanced in incubation, though the great majority were fresh laid, and the contents of these were excellent eating, without any rank flavour, and with very pale yellow yolks. In no case was there any attempt at nest-building, but each bird balanced on its own little island, resented any interference, either from its neighbour or ourselves. If by chance one of them was overbalanced, it fell on its bill and wing tips, and so remained, holding tight to its egg until, by a sudden jerk, it recovered the upright position once again.

The noise in the rookery was so excessive that we had to shout to one another to make ourselves heard above the din. The adults gave out a harsh guttural squark or a chattering gabble, and the young birds a shrill piping whistle. If we attempted to drive any of the unemployed into the water, we found ourselves engaged in a very difficult task. When scared, they seemed to have a great repugnance to leaving the shore, as we afterwards found was the case with the Antarctic Adélie Penguins. If we surrounded them and persisted in our efforts, they would dive in and appear beyond the kelp with head, bill, and neck held high in the air, while the body was so low in the water as to be hardly seen at all.

The food of the King Penguin at this rookery consisted mainly of crustaceans, fish and cephalopods: many cuttle-fish beaks being found accompanied by pebbles in the stomachs.

The King Penguins toboggan, and it was not always easy to catch a bird before it dropped down on its breast and ruined its plumage by tobogganing in the filthy mire; nor were we ourselves pleasant objects, either to sight or smell, when the chase was over, spattered as we were from head to foot with a most offensive mud.

BIRDS OF THE AUSTRALASIAN SOUTH POLAR QUADRANT.

Re the coloration of the immature, a gradual change in the pigmentation of the feathers of the crown of the head takes place, which can be traced from the first year's immature plumage, through the ordinary adult, right up to the example of extraordinary plumaged adult from the Snares Island off the coast of New Zealand.

To begin with, in the first immature plumage, which replaces the down at the end of the first year, the crown is distinct from the rest of the black head as a diamond-shaped patch of pearly bluish-grey. This is seen to be effected, if one examines the crown feathers closely, by the terminal third of each feather being pale bluish-grey tipped with a tinge of yellow, while the central third is black, and the basal third is white. If the same crown feathers are examined from the head of a bird in ordinary adult plumage the arrangement of the pigment in each feather is found to have altered completely. Instead of three bands there are only two, the terminal half being dark brown or black, with a minute amount of orange pigment intermixed, and the basal half white. Associated with this change in the individual feathers is an obvious change in the crown patch, which instead of being grey is now seen to be black with a greenish gloss, which results from the intermingling of minute dots of vivid orange pigment with the black. The same green gloss is to be seen upon the chin and throat. In the Emperor Penguin the immature birds show precisely the same pale pearly-grey patch that is found in the immature King, though the changes are not continued in the adult Emperor as they are in the adult King.

NOTE.—*Aptenodytes maxima* Molina, Saggio Sulla Storia Naturale del Chili, 2nd edn., p. 201, 1810, is a substitute name for *patagonica* Lath.=Miller.

A. cyanocephala, *id.*, *ib.*, p. 202, substitute name for *papua*.

A. saltatrix, *id.*, *ib.*, p. 202, substitute name for *magellanica*.

APTENODYTES FORSTERI.

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(PLATE 30.)

APTENODYTES FORSTERI Gray, Ann. and Mag. Nat. Hist., Vol. XIII., p. 315, May 1st, 1844 :
Antarctica. S. Lat. 64° 77' (ex Ross Expedition).

Aptenodytes forsteri Gray, Ann. and Mag. Nat. Hist., Vol. XIII., p. 315, May 1st, 1844 ;
Sharpe, "Voy. Erebus and Terror," pl. 31, 1875 ; Ogilvie-Grant, Cat. Birds Brit. Mus.,
Vol. XXVI., p. 626, 1898 (pref. Sept. 30th) ; Sharpe, Rep. Coll. Nat. Hist. "Southern
Cross," pt. IV., Aves, p. 109, 1902 ; Wilson, Nat. Antarct. Exped., Vol. II., Aves, p. 1, pls.
I-VII., 1907 ; Mathews, Handl. Birds Austr., p. 14, Jan. 1908 ; *id.*, Syst. Av. Australas.,
p. 9, 1927.

Aptenodytes imperator Bonaparte, Compt. Rend. Acad. Sci. Paris, Vol. XLII., p. 774, April 28th,
1856, as synonym of *forsteri* Gray.

DISTRIBUTION. South Pole.

Adult male. Head, cheeks, chin and upper-part of the throat black ; general colour of the
upper-parts bluish-grey, each feather with a bluish-white centre, a large patch of orange-
yellow on the sides of the neck, shading gradually into the white on the neck ; sides of
the upper-breast bordered by a deep band of black, remainder of the under-surface
white tinged with golden-straw colour ; upper-surface of flippers like the back ; under-
surface of the flippers white ; iris dark brown ; upper mandible black ; lower mandible
rose-colour, shaded with lilac, blackish towards the tip ; feet brownish-black. Total
length 1140 mm. : flipper 325, tail 98, middle toe and claw 107, exposed culmen 75, from
gape to tip 115. Weight 73 lbs. Figured. Collected at Cape Royds, McMurdo Bay,
in January.

The sexes are alike.

Chick about one week old. Covered with hair-like down ; down at the base of the nostrils
continued over the top of the head, where it widens out over the ear-coverts and down the
sides of the neck encircling the throat, black ; lores, feathers encircling the eyes, cheeks,
throat and upper neck white ; chin black ; back of the neck black, gradually merging into
the back, which is greyish-white like the remainder of the upper-parts ; tail black ; under-
surface of the body below the black gorget soiled white ; iris dark brown ; bill whitish,
black at the base and tip ; feet grey. Total length in the skin 303 mm. : exposed
culmen 18, flipper 53. Collected at Cape Crozier on the 13th of September, 1903.

Nest. None made, the egg is held on the feet, as soon as laid, by a loose fold of abdominal skin.

Egg. Clutch one. Covered in the first place with a thick white concretion ; the colour of a
fresh shell has a faint greenish tinge, which is found to be quite a deep green when examined
by transmitted light. The surface of the harder shell below is characteristically pitted
with a multitude of little longitudinal pores, each a few millimetres in length, except
where the shell has been secreted in little warty excrescences, forming in some examples
a roughness over the whole of the larger end of the egg, but in others appearing only here

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and there, collected sometimes at the smaller end, sometimes in the middle, and sometimes being absent altogether. In one or two specimens the shell is secreted irregularly, so that raised streaks or faint ridges appear running down the shell from one end to the other; the surface is therefore coarse in texture, rough and carunculated, until weathered, when it presents an unusually smooth and polished appearance with the longitudinal pores particularly noticeable. Measurements: 110 to 131 mm. by 75-85 mm. Weight of a large egg slightly incubated just short of one pound (448.5 grms.).

Breeding-season. Eggs probably laid in July and hatched out after seven weeks incubation. Young born in early September or late August.

THE following life history is taken from Dr. E. A. Wilson, in his account of the National Antarctic Expedition, published in 1907.

Our first introduction to the Emperor Penguin, the largest and the handsomest of all living Penguins, occurred on January 4th, 1902, when we had entered the pack ice and were making the best of our way towards open water again to the south. The birds were scattered here and there, singly or in couples, and much to our surprise we found that almost all were immature. It was not until we had worked our way through the pack ice, and had begun to coast along South Victoria Land, that we realised that we had left the region frequented by the immature, and had come amongst adult birds. Afterwards, we saw still fewer until we came to the fast ice of King Edward VII.'s Land at the extreme eastern end of Ross Barrier. Here in a bay, while the ship was beset with new ice, we first began to suspect that we were nearing the Emperor's breeding haunts. Away in the distance, over some miles of disintegrating ice-floe, could be seen large companies of birds which, when viewed through the telescope from the crow's nest, proved to be Emperor Penguins.

Nine months later we discovered that the Emperor Penguin lays and incubates its eggs through the winter darkness; that the chicken emerges from the egg at the beginning of September; that it has shed its down and taken up an existence, independent of its parents, by the middle of January.

The party which arrived at Cape Crozier on November 8th was surprised to find that all the chickens hatched that year had disappeared. Again and again they put large packs of Emperors on the run, but not a living chicken could be found. We gathered that the eggs were laid and hatched in all probability on the sea-ice.

It appears then that in the Emperor Penguin we have a bird which not only cannot fly, and lives on fish which it catches by pursuit under water, but which never steps on land or on land-ice, even to breed, and has so modified its habits that it carries out the whole process of incubation on sea-ice, choosing those months of the Antarctic year when the greatest cold ensures a solidity of sea-ice which can be trusted.

The next thing was to find out the breeding months. The only data that we possessed was that on October 18th of the previous year there were chicks

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of apparently ten to fourteen days' growth. We had no knowledge of the length of this Penguin's incubation. If anything, the Emperor should have a longer incubation-period than the King—first, because it is the bigger bird and the period of incubation is said to vary with the size of the bird; and second, because the temperature of the surrounding air is very distinctly lower than it is in the regions where the King Penguins breed; and this also has been said to prolong the time necessary for the purpose. The temperature ranged sometimes for ten days together from anything below -30° F. to -63° F.

On September 12th we found that we were again far too late for eggs, and that every one of them was hatched. We sadly realised the error we had made in calculating the age of the October chicks and, finding no eggs, began to supply ourselves with a series of the nestlings. In collecting such, however, as were dead and frozen on the ice, we soon came to a spot where we could see that some catastrophe had befallen the breeding colony, for we found no less than fourteen eggs deserted, lying loose upon the ice, all frozen, and many burst by the freezing, but some still perfect and uncracked. It was clear that there had been a fall of ice from the cliffs under shelter of which the Penguins had been quietly sitting with their eggs a month or two before. It is possible that the wholesale loss of eggs is not a rare occurrence.

There were in this rookery adults, both male and female, to the number of about one thousand, and not more than one in ten or twelve was occupied at the time of our visit in rearing young. We saw that the chickens with which the birds were at present occupied were distinctly smaller than those taken in October of the previous year.

We now knew a good many of the habits of this bird, and they were eccentric to a degree rarely met with even in ornithology. First in choosing the darkest months of the Antarctic winter in which to incubate its eggs, which are laid probably in the first week of July. Then, not only in the choice of season for its nesting, but of place. It must needs lay its single egg upon sea-ice with no pretence at nesting, removing the egg at once from the surface of the ice to rest upon its own feet. There it holds it wedged in between the legs, closely pressed to a patch of bare skin in the lower abdomen, and covered from exposure to the cold by a loose falling lapet of abdominal skin and feathers.

That this method which the King, in common with the Emperor Penguin, has of holding the egg on its feet, covered up by what is nothing but a fold of abdominal skin, should ever have been described as the "pouching" of its egg is much to be regretted. There is no pouch of any sort or kind into which the egg is placed, it is merely held upon the feet to keep it from actual contact with the ice or ground, and covered up by a loose and thickly-feathered fold of skin to keep it warm.

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On the sea-ice, therefore, the Emperor stands waiting for the egg to hatch. But as there is no such thing to be found in September as a bird half-starved or in poor condition, all being fat and in perfect plumage, it is obvious that the same bird does not sit on the same egg for seven weeks. It would appear that the incubation is carried out not by one bird, nor by a single pair, but by a dozen or more, which stand patiently waiting for a chance to seize either a chicken or an egg as the post of incubator becomes vacant; every adult bird, both male and female, in the whole rookery has a keen desire to "sit" on something. Certainly not more than one egg, and so one chicken, is produced by every ten or twelve adults, though why this should be the case is more than one can say; possibly it is a condition of things evolved in an exacting climate to allow each adult to obtain sufficient food through so long a period of incubation.

Not only do the barren females take their turn with the hens that lay the eggs, but the male bird also helps, and so every individual, whether male or female, has the same bare patch of skin in the median line of the lower part of the abdomen, against which the egg is closely held for warmth. What we actually saw again and again was the wild dash made by a dozen adults, each weighing anything up to 90 lbs., to take possession of any chick that happened to find itself deserted on the ice. It can be compared to nothing better than a football "scrimmage," in which the first bird to seize the chicken is hustled and worried on all sides by the others while it rapidly tries to push the infant in between its legs with the help of its pointed peak, shrugging up the loose skin of the abdomen, the while, to cover it. Although the transfer of the egg was never actually seen, there is no reason to believe that when the sitting bird feels hungry it hands over its treasure to the nearest neighbour that will undertake the duty of incubation.

That no great care is taken to save the chick from injury is obvious from an examination of the dead ones lying on the ice. All had rents and claw marks in the skin, and we saw this not only in the dead but in the living. The chicks are fully alive to the inconvenience of being fought for by so many clumsy nurses, and I have seen them not only make the best use of their legs in avoiding so much attention, but even crawl in under a ledge of ice where the old birds could not follow them, and there remain to starve and freeze in preference to being nursed. Undoubtedly, I think that of the 77 per cent. that die before they shed their down, quite half are killed by kindness. Once caught and tucked away the chicken appears to be very comfortable, but the process of changing hands, which must take place fairly often, is full of danger. Often enough the chick is almost smothered by the struggles of the heavy birds above it; often enough, too, its skin is torn by beak and claw, and from time to time

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it will be found to have dropped down a crack in the ice, where it remains to freeze in the sludge while the birds dispute its possession just above, not one of them having the sense to help it out of its dangerous position. It is not wonderful, therefore, that a very large proportion come to grief, and the season of the year in which the unhappy chicken is forced to emerge from its egg-shell undoubtedly tends to increase the enormous death-rate.

A glance at the mean temperature for each month of the year in this region will show at once that the Emperor Penguin chick, which is hatched at the end of August, has to face, in the first few weeks of its life, the lowest temperatures of the whole Antarctic year. The mean of the two Septembers of 1902-3 was -12° F. and -18° F., and thermometers within a few miles of the rookeries in that month recorded -63° F. and even -68° F. upon the Barrier.

The question that naturally arises from an infant mortality of 77 per cent. is whether or no the breed of Emperor Penguins is dying out. From all that we saw and from all that has been recorded of the wide distribution and comparatively frequent occurrence of this bird, I should say most certainly not. It is met with all over the Antarctic region. The fact of the death-rate being high at the only rookery as yet located, a rookery which was situated almost as far south as the bird has ever been known to wander, even in the summer months, does not necessarily prove that it would be as high in every other rookery. There may be conditions at this spot, local and climatic, which would account for an extra high mortality, or it may be that the bird has a great longevity and that this to some extent counteracts the effect of a high rate of death in infancy.

A very pathetic sight was to be seen resulting from the intense desire of the unemployed adults to "mother" something. Having neither eggs nor living chickens they are reduced to mothering the dead, and so it was no uncommon thing to see an old bird trying to coax a frozen infant into a comfortable position between its legs, or to see the head and neck of a lifeless chicken trailing out behind by the old bird's tail. To such an extent was this practised that very few of the chickens found dead upon the ice-floe were in a fit condition for making specimens. The down was in most cases worn by friction from off the stone-hard frozen body, and the legs and wings were in the majority of cases broken. Were it not for the interest attached to these mutilations as proof of one phase in a unique life history, few of the specimens found dead would have been worth preserving. As it was, however, we brought a number of them home.

As the size of the chicks increased the difficulty of covering them up with the flap grew greater, and when we visited them on the 19th of October we saw quite a number in which the head and shoulders alone were out of sight, the large, round, hinder quarters covered with greyish down sticking out behind, surmounted by a short black tail.

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Sometimes the chick would face the same way as the parent, and then but little of its anatomy was out of sight, for the main increase in bulk was in the lower third of its body, till the little individual became almost pyramidal in shape. The legs and feet of the chicks soon became comparatively coarse and heavy for their size. They certainly need to have them hard and horny, living as they do on the old bird's scaly feet.

The usual position taken up in the earlier stages was a crouching attitude with the head as low as the feet, and it appeared to make little difference whether the chick sat upright on its nurse's feet or lay upon its side. The chicks when quite small are invisible so long as the nurse keeps still, but have the power, and use it frequently, of poking the head out from beneath the flap to look about and whistle for more food.

If one forced an old bird with a chicken to move, it would shuffle along awkwardly as though the feet were tied together, never exposing the chicken or changing from a plantigrade mode of progression. If one hurried such a bird a little more, it would over-balance forwards, and try then to retain the chicken with its feet, helping itself along with beak and wings. If still pressed to move rapidly, the feet were involuntarily brought into action, and the chicken very soon stepped out behind, being left sprawling and piping in the open on the ice, to be pounced upon by the nearest unemployed adults without delay.

Obviously, the chicken, as I have said, are common property, and they must change hands scores of times while they are dependent upon the adults for their food. In feeding, the old birds, having regurgitated some semi-digested food into its pharynx, allowed the chicken to supply itself from there by poking its head and bill inside the parent's mouth.

The food of the Emperor Penguin consists mainly of fish and cephalopods, the bones and the horny beaks of which are constantly accompanied by pebbles in the stomach. Crustaceans of various kinds are eaten as well as fish, but the latter seem to form the bulk of their ordinary diet. That so many large birds are able to find food for themselves in these southern waters, even in the depth of winter, proves conclusively that there is a great abundance of marine life under the ice throughout the year. That fish were so abundant we knew mainly by the contents of the stomachs of seals and Penguins.

It may seem strange that during the winter months the sea was not so completely frozen over as to prevent the Penguins from entering it every day. One realises, on skinning an Emperor Penguin, that the very substantial layer of fat beneath its skin, quite indispensable in such a climate, can only be maintained by a constant and abundant take of food at all times. The season of the year when this layer of fat is most ample is, as one would expect,

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toward the end of the summer months and before the moult, when the new feathers underneath the skin will be found embedded in a mass of fat at least an inch in depth all over. This layer is much reduced by the growth of the new feathers and by the period of starvation necessarily undergone during the moult, when nothing will induce the birds to enter the water.

The fish which forms the Emperor Penguin's staple diet is a small silvery species of from 4 to 6 inches in length; the crustaceans were mainly *Euphausia* and schizopods, while the cephalopods were of considerable size, a foot or two in length, judging by their beaks. The pebbles were no doubt of use in the trituration of the fish bones and harder parts of the crustaceans' shells. They were always present, in the young and in the old, and were found even in the stomach of a chick which could only have emerged from the egg a day or so before. Exactly where the pebbles came from is not at first sight evident, seeing that the birds are never on land. Probably they are picked up at the bottom of the shallow seas, or some of them may be found on floating glacier-ice. Much grit and gravel, even of a considerable size, is blown some distance on to sea-ice from the neighbouring coast-line. It may be that this affords the birds the supply they need. Occasionally the stones are passed with the excreta, and may be found in the radiating pattern which is left upon the ice-floes where a company of Emperor Penguins has huddled together for warmth and rest in their spring and autumn wandering.

These wanderings are worthy of a note in passing. They keep well together always, travelling in single file, now and again halting to huddle together in a heap, all facing a common centre, presumably for warmth and sleep. Occasionally, the tracks showed that a bird had preferred to travel on its breast, but as a rule they all were walking. Always full of curiosity, they would stand round in a group making comments to one another. They had no objection to being photographed, but resented being stroked. Such a group formed an exceedingly beautiful picture: their lemon-yellow breasts shone like satin in the sun, and their bluish backs and jet-black heads set off the golden-yellow patch on the side of the neck, and the rose or lilac streak on the lower bill. The back and breast, if the bird had just been in the water, would glitter with crystals of ice and salt. Such is their size and colouring that they would form a striking feature anywhere.

The average weight of thirty-three of these birds, all of which were adults and in full plumage, taken in November, was $70\frac{1}{2}$ lbs. Only one was below 60 lbs. Fourteen came between 60 and 70 lbs., fourteen between 70 and 80 lbs., three weighed respectively 80-80-87 lbs., and one scaled the record weight of 90 lbs.

Their method of progression varies much with the necessity for speed. When left to themselves the birds invariably walk bolt upright with great

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dignity, but if alarmed in any way immediately drop down on to the breast and toboggan rapidly along by alternating strokes of their powerful legs and wings. If overtaken in their efforts to escape, the birds will at once rise to their feet and show fight, facing their antagonists and using bill and flippers simultaneously, and the stroke of an Emperor Penguin wing, if caught fairly on the hand or on the skin, leaves a bruise which will be felt for many weeks.

When pressed to travel as fast as possible they glide along on the ice at the rate of about eight or ten miles an hour. This rate is, of course, much exceeded in the water, where their speed and dodging power probably rivals that of fishes, seals and whales. They swim with their wings, and may often be seen to leap from the water and land upright on a shelf of ice at least four feet above the surface. Their only enemies, so far as is known, are also inhabitants of the water; and their ideas of fear are connected chiefly with that element, as in the case of the Adélie Penguins.

There is no doubt that the Sea Leopard is one of the Emperor's active foes. Neither *Catharæta maccormieki* nor *Ossifraga gigantea* should be considered the natural enemy of the Emperor Penguin, for I do not believe that the Petrel attacks living things as a rule; nor has the Skua any opportunity to attack the Emperor Penguin's chickens, since at the time of their infancy, in the winter and early spring, they are many hundreds of miles to the south of the region then infested by the Skuas.

The Emperor Penguin sleeps either standing in the upright position, with its head turned back over the shoulder so that the tip of the beak rests under the back of the wing, or else in the prone position with head drawn in upon the neck. The positions assumed by the chick seem to be slightly different. Whether the former posture is a relic of days gone by, when the bird had a fully-feathered wing and was capable of flight, it is not easy to say; but it is suggestive to see it take up an attitude which would have been comfortable when it had thick warm feathers into which to breathe. It may be that the position is merely a convenient one for balance, and it is quite certain that all comfort must have disappeared since the wing became converted into a bony flapper. The prone position is certainly more reasonable with a view to economising body heat. Both attitudes are assumed by the chick in its earliest stages when taken from the adult.

We found the temperature of the Emperor Penguin to be 100·7° F. The rate of the pulse in a "pithed" bird was sixty to the minute, and the respiration in a chicken twenty.

There were no parasites discoverable on the skin or amongst the feathers of the Emperor Penguin—a fact which is somewhat remarkable, and one which

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holds good, as far as we were able to make out, for all Antarctic birds and beasts, in direct opposition to the experience of observers of Northern Polar birds and animals.

The cry of the adult Emperor is far louder, more prolonged, and more musical than the harsh croak of the Adélie Penguin. It is a defiant trumpet-call, and can be heard at a great distance over the ice-floes. This is its rallying call note, and is emitted with the head erect, but it has also a clucking or clattering note to which it gives expression in a different way. Bending the head and neck down low on the breast in a powerful expiratory effort, it then, in raising it, gives vent to an interrupted musical cry as the lungs are filled with air. The supraclavicular hollows can be seen distinctly emptying as the head goes down; and filling out again as the head is raised. The cry of the chick, which is noted elsewhere, is a more definite utterance of four notes emitted in the same way, and bearing a faint resemblance, according to our worthy bluejackets, to the words, "Gimme some more, gimme some more," which is at any rate always implied exactly, even if the resemblance was somewhat vague.

The bird occurs probably throughout the whole of the Antarctic regions within the limits of the ice, or, more exactly, it ranges longitudinally from 151° E. in Victoria Quadrant, through Ross Quadrant, to about 50° W. in Weddell Quadrant.

It appears that the various ages have each their own particular range during certain seasons, and that whereas the pack-ice is regarded as a safe nursery for the youngest birds in summer, the more advanced immature birds, which, at seventeen months, are then on the point of moulting, wander south to find fast ice on which to remain while the process lasts, knowing that in the disintegrating ice-pack they might be forced to take to water when it would be highly inconvenient for them to do so.

Similarly, the adult birds, having finished all their duties to the young, now leave them to themselves, and also retire southwards in January and February to take up their retreat and moult in safety on fast ice. This accounts for the groups we met in full moult in January 15th, 1902, in the secluded bight known as Lady Newnes Bay; also for the multitude we saw in the fast ice of King Edward VII's Land on January 31st, 1902, and for the various examples taken in January 1903, and in February 1904, all in full moult or with the moult just completed, in McMurdo Sound.

We have substantiated the following facts: first, that the Emperor Penguin chick remains but four months in the down, a most astonishing fact if, as seems to be the case, the King Penguin chick remains in down for fully ten months; that it then moults to assume the blue-grey plumage with the

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whitish throat which characterises the birds of five months old to be found in the pack during January. This same plumage is to be seen a year later in a brown and faded state, with blackish feathers sprinkling the white throat, and the whole about to be shed, in February, when the bird dons the first adult plumage, and all the characters of the fully adult, though not as yet the richness of colouring that it will assume at the next annual moult.

The moult, from immature to adult plumage, takes just 20 days from start to finish. The feathers clinging close to one another came off in spurious sheets or handfuls, first from the breast and thighs, and then from the face and tail and flippers, but most irregularly, until at length there was nothing but a ruffle or collar of old feathers round the neck.

The young feathers embedded in a mass of fat beneath the skin grow rapidly and push the old ones out, so that often a mere touch will detach a hundred feathers from the bird *en masse*.

In all probability, not only are the superficial scales of the feet shed as well as the feathers, but also the plate on either side of the lower mandible. The superficial layers of these horny parts, at any rate, become loose, and, in the Emperor, change the colour of the beak, rendering it dull and opaque, and the feet brown instead of black. The coloured plates of the lower mandible can easily be removed in a moulting bird, and are then found to be of a translucent yellow horn.

In the young chick the colouring of the iris is a rich dark brown, varying a trifle in warmth from dark walnut, though never reaching the redness of mahogany. The bill is blackish at the tip and base and whitish in the centre, while in the older chicks there is sometimes a faint dusky purplish tinge in the lower bill. The feet and nails, at first pale fleshy-grey or the colour of French chalk, become darker day by day, till in the third week they are definitely black.

In the immature bird, after shedding the downy feathers, the whole of the back becomes bluish-grey, the blue tinge preponderating and encroaching on the head and neck. The chin is grey and mottled, but the throat, instead of being black as in the adult, is white, with here and there a greyish feather showing through, though in some the demarcation line between the dark chin and the white throat is quite distinct. The iris in this stage also is a rich dark brown, and the bill has become dusky throughout, with a dull purple tinge upon the mandible. The feet are black, as also are the claws; this holds good for the adult bird as well. The beak, however, alters, the side plates of the lower bill now show a decided orange-yellow tint, less marked than in the fully adult bird, but still distinct. The whole plumage in this stage has a brown and faded appearance, and the patch on the side of the neck has become quite white.

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The first adult livery is not quite so rich in colour as it becomes after another moult, but is in other respects similar.

The tail-feathers, twenty in number, become worn to mere quills, and often in the breeding rookery one may find all the tail-feathers detached from the bird and lying embedded in a large lump of hard and dirty ice upon the floe. The scales on the feet also will be no longer a rich black, but brown.

If one compares the measurements of the birds in these various stages of growth, one finds that great changes are effected in the bill; the chief alteration takes place by the lengthening of the upper mandible, the curve of which gradually increases. With this growth proceeding at a faster rate along the culmen than the tomia, the nostrils, which are very definite and well marked in the first few months of life, gradually become obscured. So also the thickening, which is apparent on the culmen about one-fourth of its length from the tip, is also gradually obliterated by the elongation of the upper mandible. This thickening has served in place of an egg scale, which is not developed as a deciduous element at all. The angle of the gonys, too, which is quite apparent in the lower mandible up to the fifth month, gradually disappears with the lengthening of the bill, and eventually the strong uniform curve of the adult bill develops to its full extent. Thus:—

	Nostril to Tip of Bill.	Gape to Tip.
5 months old	3·5 cm.	8·1 cm.
18 " "	4·3 "	9·3 "
20 " "	—	10·5 "
30 " and onwards	4·5 "	11·8 "

The adult measurements of the wings are reached much earlier, even within the first six months, as also are the measurements of the feet and claws, presumably as a result of the necessity for extra strength and efficiency in those parts to avoid natural enemies over and above their uses in obtaining food, while the bill lacks this stimulus to rapid growth.

The individual variation to be found in a series of Emperor Penguins amounts to very little indeed.

The colour of the side plate of the lower mandible is variable, from yellow through orange and red to lilac; but it seems to depend to a certain extent on the condition of the peripheral circulation, turning to a livid lilac when the circulation is depressed by cold. The depth of the lemon-yellow colour of the breast and abdominal feathers varies considerably according to the extent to which the summer sun has faded it. When freshly moulted the whole of the lower parts must be described as pale lemon-yellow, not white.

In describing the immature bird also, there is a point worth noting in the colour of the crown, which is of pale bluish-grey, marked off as a distinct patch

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from the darker grey which surrounds it. The bluish patch is noticeable during the first seventeen months, but the head then becomes jet-black all over. The point is the more interesting because it is exactly reproduced in the first prenuptial plumage of the immature King Penguin. As a grey coronal patch it is lost in both King and Emperor when the immature plumage is discarded, but in the King the tendency to differentiate in colour in this part of the head is again brought out by the disposition of minute quantities of golden-yellow pigment in the coronal and particularly the superciliary feathers, which, with the black, gives the crown a greenish sheen. This is also to be seen upon the chin and throat.

The most puzzling fact about the Emperor Penguin is that the colouring of its nestling is totally different from that of the nestling of the King. In direct contrast, it has a jet-black head with a pure white area surrounding each of the eyes. The black of the head, starting from the base of the upper bill and including the forehead, lores and chin, is continued over the crown to the nape of the neck. There it blends with the silver-grey of the back, to be continued as a grey or blackish band, almost, but in most cases not quite, meeting on the fore-neck as a collar. Between this collar and the chin, which is jet-black, the throat is pure white, as is also a rounded area including the cheek, eyebrow and ear-coverts. The minute little tuft of stiff feathers which constitutes the tail is jet-black, and the whole of the remainder of the down covering the body is silvery-white or grey, with this notable peculiarity, that the darker area is on the under-surface, extending from the fore-neck to the vent, over breast and abdomen, whereas the white area is on the dorsal aspect including the nape, mantle, scapulars, back and rump, as well as the minute and downy-coated flippers; thus reversing the usual order, in which the under-parts are lighter, or at least not darker than the upper.

I do not consider that the white coloration of the Emperor chick has anything to do with the theory of protective assimilation. The young bird while in the down is careful never to leave the ice, and there can be no reason to think that it requires any protection other than its parents can give it until it sheds the white down and takes on the dark grey plumage of the first year's bird.

The complete absence of any protrusion of the brow or superciliary prominence gives the bird a quizzical look which is always entertaining. The movements of the eye are quick, and the upper lid is raised to look upwards without much motion of the head. The outer coverings of the eye are almost flush with the outer contour of the face and head; there is no attempt to offer it protection by bony ridges, but every effort is made to produce an eye so placed as to catch the glint of a fish above, below, ahead or astern, while the bird is in its element under water in search of food.

EMPEROR PENGUIN.

Probably for the first month or two of its life each chicken puts on rather more than half a pound per week, but in its third or fourth months this average must be largely increased, for in January the chick reaches a bulk equal to about half that of an adult bird, and probably weighs as much as 30 lbs.

The voice of the chick is a very shrill rattling pipe or whistle when it is hungry. First it lowers its head to the ground, craning the neck to its full extent, and then suddenly swings it up as far as it will go, rattling out a very shrill piercing whistle of four notes. It is a crescendo pipe, rising in pitch and in shrillness and suddenly dropping at the end note. Out on the ice in the open air the rookery sounds as though it were full of farmyard chickens.

In captivity a chick used to be constantly preening its downy feathers, and then, standing upright, would crane its neck and quickly flap its wings backwards and forwards as one sees a young duckling do, making a quaint subdued little crowing noise at the same time. The movements of the eyes and eyelids were most peculiar, the eyes being so set in the head of the chick that, without turning sideways, it could see everything above it. Owing to the absence of any eyebrows the cornea was almost flush with the convex outline of the head, which was covered by a very short and velvety down. The legs were set widely apart, and with the capacious abdomen and the immense beam of the hind quarters formed a most stable support for the agile neck and for the head, which was shot in various directions with great rapidity, the bird being exceedingly inquisitive and ever ready to peck and worry at an intruding hand.

The birds breed at Cape Crosier, which is a focus for wind and storm, where every breath is converted, by the configuration of Mounts Erebus and Terror, into a regular drifting blizzard full of snow.

DASYRAMPHUS ADELLÆ.

ADÉLIE PENGUIN.

(PLATE 31.)

DASYRAMPHUS Pucheran, Voy. Pôle Sud., Zool., Vol. III., p. 154, Oct. 10th, 1853. Type (by monotypy): *Catarrhactes adeliæ* Hombron et Jacquinot.

CATARRHACTES ADELLÆ Hombron et Jacquinot, Ann. Sci. Nat. Paris, Ser. II., Vol. XVI., p. 320, after Nov., 1841: Adélie Land, Antarctica.

Catarrhactes adeliæ Hombron et Jacquinot, Ann. Sci. Nat. Paris, Ser. II., Vol. XVI., p. 320, after Nov., 1841.

Pygoscelis brevirostris Gray, Gen. Birds, Vol. III., p. 641, July 1846, as synonym of *adeliæ*.

Aptenodytes longicauda Peale, U.S. Expl. Exped., Birds, p. 261, in or before Oct. 1848: S. of 60° lat. (Knox Land). (64° 40' S.: 103° 4' E.)

Dasyramphus adeliæ Pucheran, Voy. Pôle Sud., Zool., Vol. III., p. 155, pl. 33, f. 1., Oct. 10th, 1853.

Dasyramphus herculis Finsch, Proc. Zool. Soc. Lond., Oct. 1st, 1870, p. 322, pl. 25: (Adélie Land) Antarctica.

Pygoscelis adeliæ Ogilvie-Grant, Cat. Birds Brit. Mus., Vol. XXVI., p. 632, 1898 (pref. Sept. 30th); Sharpe, Rep. Coll. Nat. Hist. "Southern Cross," p. 113, pls. 7, 8, 10, 1902; Wilson, Nat. Antarct. Exp., Nat. Hist., Aves, p. 36, pls. IX.-X., 1907; Mathews, Handl. Birds Austral., p. 15, Jan. 1908; *id.*, Syst. Av. Australas., p. 9, 1927.

DISTRIBUTION. Antarctic Seas.

Adult. Upper-surface dark bluish-grey; chin, throat and sides of the face blackish; remainder of under-surface silvery-white; wing like the back, edged on the inner side with white, under-surface white with the upper edge and tip bluish; tail of fourteen feathers; eyes brown; bill reddish; feet flesh-colour. Total length 610 mm.: culmen exposed 30, from gape 52, wing 190; tarsus 25, tail 155.

The sexes are alike.

The immature have the chin and throat white.

Chick in down, uniformly dark and sooty. The changes undergone as the nestling grows shows that the colour of the head is in all cases somewhat blacker in the earlier stages than the remainder of the body. But this difference gradually disappears, owing no doubt to the change in the nestling's down.

Nest. A ring of stones varying in size according to the owner being a good or bad "getter."

Eggs. Clutch two (three days elapsing between the laying). In shape they are equally rounded at either end. The outer texture of the shell is chalky and under this is a green colour which by transmitted light is very marked. 64-72 by 50-55 mm.

Incubation-period. 31-34 days.

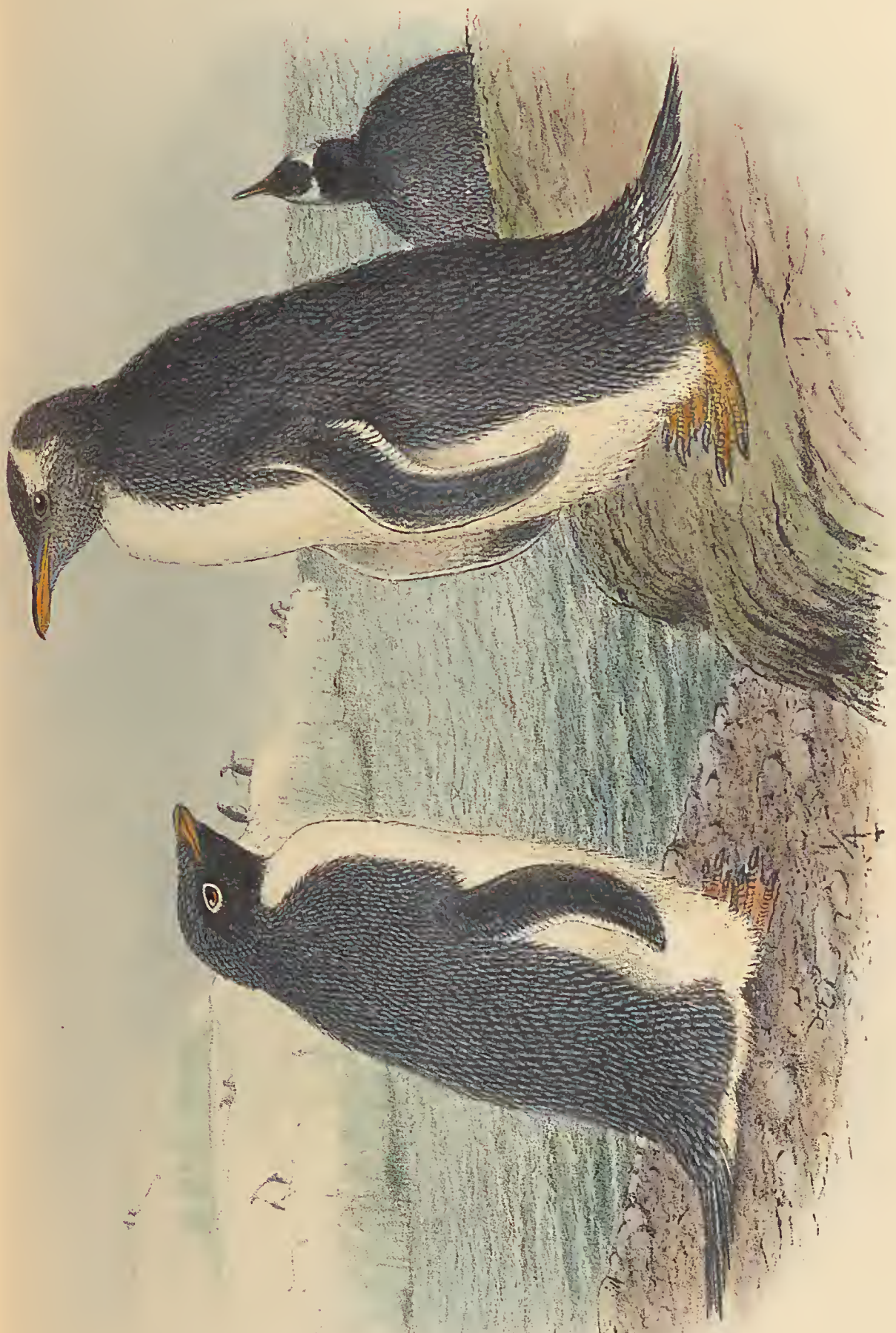
Breeding-season. End of October to beginning of December.

Witherby & Co

PYGOSCELIS PAPUA
(ROCK HOPPER)

DASYRAMPHUS ADELIAE
(ADELIE PENGUIN)

H. Grönvold, del.





ADÉLIE PENGUIN.

THE following account is taken from Dr. E. A. Wilson's National Antarctic Expedition, published in 1907.

On January 5th, 1902, we were for the first time amongst the more extensive ice-floes, and these, being far more closely packed, afforded an excellent opportunity for the inquisitive little Adélie Penguins to run long distances towards us and with many halts to gaze and cry in wonder to their companions; now walking along the edge of a floe in search of a narrow spot to jump and so avoid the water, now with head down and much hesitating, judging the width of the narrow gap, to give a little standing jump across, as would a child, and running on the faster to make up for its delay. Again, coming to a wider lead of water necessitating a plunge, our inquisitive visitor would be lost for a moment, to reappear like a jack-in-the-box on a nearer floe, where, wagging its tail, he immediately resumed his race towards the ship. Being now but a hundred yards or so from us he pokes his head constantly forward on this side and on that to try and make out something of this new strange sight, crying aloud to his friends in his amazement, and exhibiting the most amusing indecision between his desire for further investigation and doubt as to the wisdom and propriety of closer contact with so huge a beast.

The number of Adélie Penguins increased day by day as we made our way through the ice-pack towards the south. We saw about an equal number of birds in the adult and immature plumage to begin with, but when we reached, on January 8th, the southern edge of the pack, those in adult plumage vastly preponderated.

The pack-ice is a place of safety for the immature birds; here they live and move and find their living in comparative safety for the first two years of their existence, possibly in many cases for the first three years. Here they feel nothing of the ocean swell, which is practically lost under the weight of floating ice within half a mile of the open sea, while they can find shelter from the wind and drift under a friendly hummock. Here they have always a handy retreat upon an ice-floe when hunted by the Sea Leopard (*Stenorhynchus leptonyx*), or the Killer Whale (*Orca gladiator*). Here, too, they bask and sleep in safety when they have filled themselves to satiety with the crustaceans which literally swarm amid the ice-floes, probably because of the abundance of diatomaceous refuse in the melting and discoloured ice. Here, too, they may confidently trust to a foothold which will last them while they moult their feathers in the autumn, when for a fortnight they are bound to avoid the water and sit disconsolately fasting in little knots under the lee of one of the larger hummocks.

As we entered open water from the southern limit of the pack, and came in sight of the cliffs of Cape Adare, the numbers of adult Adélics rapidly increased and no more were seen in the plumage of immaturity.

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As we neared Cape Adare, we had Adélie Penguins in the water all around us, birds by hundreds dashing in and out like little dolphins, making very rapid travelling through the water, shooting into the air with heads drawn in and wings appressed, just clearing the water by a foot for a yard or more, and then with the slightest little splash. When first seen, they may easily be mistaken for a school of fish. Under the water, they wing their way with powerful strokes, often in a zig-zag course, especially if frightened, as a means, often no doubt, of baffling the seals and killer whales that are their terror. The feet and tail in this method of progression are used for steering only, but if the bird is at the surface, floating, as he does, low in the water, instead of the wings the feet will be used for propelling.

In landing on a shelving shore, the bird merely swims till he can stand upright and walk, but in landing from deep water on an ice-floe with its edge a foot or two above the water, he leaps like a salmon, with this difference, that instead of allowing his body to follow the curve of motion, he preserves the vertical position and lands upon his feet, immediately running a few paces or falling sometimes on his breast; and in this landing leap the stiff tail-feathers must be of use in preventing any tendency to fall backwards.

Three feet is a good leap, though their powers are not often put to such a test. In leaping from floe to floe across a crack of open water they show no great athletic capabilities, and in crossing six inches or a foot, which is about as much as they ever dare attempt, their movements are exactly what one is wont to see if the same feat is performed by a child of three. If in their wanderings they come to a crack which is too wide to jump, and yet not wide enough for plunging into, they will follow the edge till they find a point more suited to their tastes; but it takes much time and many hesitations before they decide the thing to be possible for either.

Time, happily for them, is no object; but this at first sight one would hardly guess, their movements being always precise, busy and preoccupied. It is only when one has watched a little party hurrying along for full half a mile in a direct line, as though upon some urgent business, suddenly stop and all go to sleep, or suddenly turn and go off in another direction, or come back upon some equally urgent call, that one begins to realise that their business is not always so important as it looks.

On flat ice or snow they seem to prefer walking, balancing themselves with their flippers, and leaving between their footmarks a sinuous track made by the tail. If hurried or fatigued by soft snow they will fall on their breasts, the polished feathers of which form an excellent runner surface for tobogganning. They then leave a track which takes the form of a straight

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smooth groove with foot and wing marks on each side, each working in alternation with the other.

On land, as, for example, in the rookeries, they progress as far as possible on their feet, and in making the longer journeys up the mountain sides, over very craggy rocks and really difficult steep, they bring bill and wings into use as well as feet and nails, and blood stains in their tracks show that sometimes they must suffer in the process.

At Cape Adare, where some of the birds nest at a height of nearly 1,000 feet, their pathways are peculiar. They choose, to begin with, the gulleys and "chimneys" which are more or less filled with snow drift, and the constant procession of birds up and down these gulleys in the steep mountain side gradually wears a number of deep cuttings in the hard snow, which intersect one another in every direction, and leave lozenge-shaped pinnacles standing in between.

The pace at which these birds can travel in the water rivals that of many fish; on land they are, of course, not so fast, though their pace when tobogganing on their stomachs is about as quick as a man can run on ice and snow, and a great deal faster than the birds can travel on their feet.

There is the quaint habit in this bird, as well as in the Emperor and the King, of sleeping in an upright position with the bill tucked in behind the flipper. It sleeps at times on its breast with the head drawn in upon its neck.

The food of the Adélie Penguin during the summer months consists almost entirely of *Euphausia superba*, a red shrimp-like Schizopodous crustacean, which exists in vast numbers in the shallow seas of the Antarctic. These red crustaceans can be seen sometimes in large numbers in the water, frequenting chiefly the ice-pack, the edges of the ice-floes, or the foot of the ice cliffs which form the sea faces of the Barrier snow plains. Here, therefore—in the early hours of the morning, more abundantly than at any other time, but at every hour in the twenty-four as well—may be seen hundreds of Penguins feeding, their black heads and loud voices proclaiming their business, while they swiftly dash in and out of the water in small companies like a school of little dolphins.

In its passage through the alimentary track the colouring matter of this crustacean is apparently little altered, so that the ground which is occupied by an Adélie Penguin rookery takes on a brick-red colour from the excrement, and this can be recognised by sight, even at a very considerable distance from the shore. Not only does the general colour of the ground give evidence from afar of the situation of a rookery of Adélie Penguins, but the smell has

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in more than one case directed us to search for and discover a hitherto unsuspected colony. The smell is unpleasantly fishy and ammoniacal and quite unlike the smell of anything else. On one occasion this smell was forced upon our notice when we were no less than thirty miles from the nearest Penguin rookery.

The quantity of crustaceans brought in during the day to such a rookery as that which exists at Cape Crozier or Cape Adare must be immense, for parents hurry in ashore from one end of the twenty-four hours to the other without cessation, their stomachs loaded with a mess of shrimps. Chickens by the hundred stand in little groups of twelve to twenty, now in a state of bulging repletion, now in a ravenous hurry, chasing some unfortunate adult but lately arrived with spoil from the open sea.

One may, therefore, infer from the uniform colour of the thin layer of guano in every Adélie Penguin rookery that these red crustaceans do form their staple diet; but at Cape Royds I have known them eat small fish, some three or four inches long, and no doubt they also feed on cephalopods, the beaks of which are often found in their stomachs. Beyond the remains of fish, cephalopods, *Euphausiæ*, and other crustaceans, an invariable concomitant in the stomach of this bird is a collection of small pebbles, swallowed, no doubt, for the purpose of reducing to a pulpy mass the indigestible parts of the crustaceans. That these pebbles are very necessary may be gathered from their constant presence in the stomach. There is no separate crop or gizzard, as such, in Penguins, where the stomach forms one large undivided muscular sac capable of great distension.

The chicken is entirely dependent upon its parents for food from the time it leaves the egg until it has completely shed its down and has assumed a feathering which enables it to enter the water. Undoubtedly it requires a very large supply of food, for its growth is rapid and the state of repletion which eventually brings the chicken to consider that it has had enough is not readily arrived at. One wonders how the young that are hatched out on the summit of such mountainous heights, nearly a thousand feet above the sea, can ever obtain a sufficiency of food. Yet they are as well grown and as healthy there as they are at the sea level, thanks to the untiring efforts of their parents, who form a constant stream passing up and down the sides of the mountain in beaten tracks. One cannot but marvel at the persistence with which these little birds, using their feet, bills and flippers, laboriously climb to the summit of such rugged slopes. Why, one wonders, should they ever set themselves such an infinite amount of unnecessary labour when there is ample room for them to nest and rear their young on the flat moraines below?

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The observations made show that but two journeys could be made to the summit during the twenty-four hours.

To return now to the actual feeding of the chickens. They have a method which is altogether entertaining, a method which exemplifies in a direct and indisputable manner the far-reaching law of the survival of the fittest. One may stand in the noisy crowd of Penguins at Cape Crozier and watch the law in being from its many-sided aspects; the cruelty, the pathos, the humour, and yet the admirable perfection of the whole system being irresistibly brought home to the observer.

The sooty-grey young ones in the third week of January were almost as big as their parents, and quite as active. Of these young birds there were literally thousands, and all were hungry, many very hungry. Moreover, each individual chicken acted upon the supposition that every old bird, as it came up from the shore, was full of shrimps. On this assumption the old bird had no choice but to run the gauntlet. Chased incontinently up and down the rookery by the unfortunate infants, the fond parent ran hither and thither with a keen eye open for the chicken it once had called its own. Driven at last to bay, it could only turn to swear and silence its persecuting followers for the moment with a vicious peck, but the moment its search again commenced it would be caught up and followed and worried in precisely the same way by a fresh relay of young ones, all belonging to someone else. Although the chicks looked upon each full-bellied adult, not only as a parent, but a food supply, the parents tried to find and feed their own offspring. The more robust of the young worried the adult until he was fed. But with the less robust a pathetic ending was the rule; it got weaker from exhaustion, cold and hunger till a Skua in its beat drops down beside it, and with a few strong vicious pecks put an end to its failing life.

All round the rookery are Skuas' nests with their young, of which not 50 per cent. survive their infancy; not 30 per cent. of the Emperor Penguins' chicks survive; and from the corpse-strewn condition of the acres occupied by an Adélie Penguin rookery, where not merely egg-shells by the score, but mangled chicken remnants by the many hundred, lie to be trodden into frozen dust and muddy guano, the death rate is excessive. No one can walk over a mile or two of such a breeding ground without being astonished by the number of dead around him. He will notice, moreover, at once that it is not only the youngest of the chickens that die, but that a very large proportion are birds which have already shed their down and have assumed the plumage which enables them to take the water.

The Adélie Penguins begin to arrive at Cape Adare as early as the middle of September, but the more southern rookeries at Cape Crozier were tenanted

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only by a few dozen stragglers even so late as October 19th, 1903. Within a week they numbered many thousands, the nesting sites had been appropriated, the stones and pebbles with which they make their nests had been freely fought for, and were now by theft being as freely circulated from one end of the rookery to the other.

The Penguins' courtship was in full swing, and on every nest squatted the lady while her knight slept standing at her side, or woke to pay her the attention that his chivalry suggested. There are many misunderstandings in these colonies over the misappropriation of property. The nests were all too close to one another, and he had the biggest nest who could most successfully annex his neighbour's pebbles and prevent his own from being stolen. Needless to say, there was hardly a stone of his nest but had been taken from someone else.

The males fight with each other. The females, sitting on their nests, have quarrels with their neighbours, but whereas they follow the time-honoured custom of fighting with their bills, attempting to cut out each other's tongue, the males fought chiefly with their weight and flippers, and the blows resounded afar as they were hailed down upon the unlucky wight, with a torrent of abuse. But plucky they certainly are, for again and again, when overborne and forced to give way a bit on all fours, the beaten individual will be seen to turn and confront his persecutor on his legs again, his eyes aflame, his ruffle up, his chest out, and his flippers working like a windmill.

The voice of the Adélie Penguin cannot be ignored, especially when one hears it flowing freely from the throats of many thousands. From a distance it is like a whistling roar. They begin at one's approach in a low, hoarse, swearing growl, which gets gradually louder and higher in pitch, while the bird bridles up with ruffled crest in front of his swearing spouse. Then, making a wild dash at the intruder's legs, he seizes such garments as he can reach and unmercifully batters his shins with a rain of blows that have been well compared to the rattle of a boy's stick along some corrugated iron palings.

The noise is kept up night and day, with a lull about noon. The call note is "Aark" or "Caark" and is best imitated by blowing sharply on the edge of a blade of sword-grass held between the ball of the thumb and the index finger. Sleep is snatched when and where it is needed, and birds may be found sleeping in the rookery at all times of the day or night, as well as on the ice-floe miles away from anywhere.

The voice of the chicken is a whistling pipe, very shrill, very pathetic, and very aggravatingly persistent, one would think, to the adults, who often show their annoyance by scolding their infants roundly. As the nestling grows, the pipe gets louder and more shrill and more persistent until the down

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is shed, and the bird undertakes its own responsibilities. It then drops the whine and takes on the cry of the adult, a little more shrill and somewhat quavering at first, but gradually merging into the full-voiced cry of the adult.

No nest at Cape Crozier contained eggs on October 19th till 29th. The nesting sites are arranged with some method, not here and there as the builders fancy, but in groups with neutral ground between them. From ten days to a fortnight after their arrival the birds begin to lay, and when each nest contains two eggs the serious incubation begins. Lasting from thirty-one to thirty-four days. Three days elapsing between the laying of the eggs. Incubation is shared by the cock as well as by the hen. I had the opportunity of seeing the two change places. The hen presumably was sitting on the eggs when the cock came up to her and she presently stood up. Then began the weird motions that go on in courting times. Standing breast to breast each rubbed its neck against the other's, first one side and then the other alternately, with a gentle cackle all the time. The cock was now and again allowed to see the eggs and touch them with his beak and rearrange a stone or two of the nest, and this went on for several minutes, she loath to go, and he, I presume, assuring her the while that she should go and get some shrimps, for there is no fasting during the period of incubation; presently the hen stepped off and the cock at once walked in and commenced to sit upon the eggs. The climatic conditions for these birds is not so severe as those which the Emperor Penguin faces, but they are severe enough in their way. During September to April the lowest temperature the bird would be subjected to was -41.8° in October.

Up to January 9th the chicks were still all in their several nests, being tended and jealously watched, and kept from wandering or being interfered with, by their parents; two chicks were in every nest, but often remarkably different in size, one being twice as big as the other and probably three days older. When the chicks huddle together in heaps a few reliable guardians are stationed in a circle round the *crèche*. In groups, in which they mutually support one another from the Skuas, they are more protected than would otherwise be the case. The Skuas, however, are always on the watch and sooner or later a chicken is separated from its group and falls a victim. When this happens the complete indifference of the older Penguins was surprising, for they showed the greatest courage in defending their eggs and chick from us.

Of its cleanliness there is nothing to be said but praise, for no bird on earth could possibly be more strictly clean than the Adélie Penguin.

It takes two years to reach maturity. It joins the breeding colony for the first time not at the end of its first, but of its second year. Appearing from the egg in the middle of December, the colour of the little downy-coated

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nestling is somewhat variable. Two are almost always hatched in each nest; one is generally about twice the size of the other in the earlier stages of their existence.

In the majority of the chickens the down is uniformly dark and sooty, which gives way before long to a smoky colour, which gets an old and dirty look by the time it begins to loosen on the under-surface of the flippers. This moult begins on the abdomen and the thighs, where the white side stripes appear as the new feathers are disclosed; those parts being the first denuded simply because they bear the brunt of the wear and tear. Then it is shed from the face and head, round the bill, and round the tail. The upper breast and neck and back hold longest to the down, which will now be clogged with ice and dirt and snow, all of which are abundant in the rookery from time to time.

The colour of the feet meanwhile has also been undergoing change. When first the chicks are hatched their feet are very dark, and in the youngest nestling we obtained they were a very dusky blackish-red. This rapidly alters for a clear bright red, which reaches its maximum in about three weeks and then gradually turns to pale flesh-colour on the dorsal, and black on the plantar surfaces and these are retained by the bird for life. The soles of the feet are uniformly black as a rule. The colour of the nails is blackish to begin with, but they gradually change in a couple of months to brown. The nails of the adult are long and brown on the upper-surface. Underneath they are darker and there is a surface marking, which is due, apparently, to the wearing of the nail, the deeper parts of which are of a different density to the surface layers.

Returning now to the change of colouring which takes place at the finish of the first moult when the nestling down is shed, the first noticeable point is that the throat is white. The general colour of the upper part of the head, neck and back is bluish-black, with a sharp demarcation line dividing it from the pure white throat, fore-neck, breast and abdomen. The flippers are bluish-black above and white beneath, with blackish patches at the tips, which vary much in size and may be absent. The bill in the adult is brick-red with black on the tip and upper-surface of the upper mandible, while the lower is black upon the sides along the cutting edge. The eyelids in the nestling are black, and become white only at the second autumnal moult. In the immature plumage the suggestion of white eyelids at times by the habit the bird has of showing the white sclerotic above the coloured iris; in the adult this habit enhances the value of the pure white eyelids which are so characteristic. If the bird is watched when neither frightened nor excited the prominence of this white ring is much reduced and the upper lid is almost hidden under the black feathers of the brow. The colour of the iris varies

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between a warm or almost reddish-brown and a brown which has a decided greenish tinge.

It is in this plumage that the young is finally left to its own resources at the end of the breeding season.

We were able to prove conclusively that the Adélie Penguin takes fourteen months to assume its adult plumage and two years to reach maturity. The brown plumage is merely the weathered condition of the first year's suit, in which some of the blue colour remains, but from which the black has faded by the weathering of a winter and of a summer's sun. We were struck more by the extraordinary uniformity of the adult plumage than by the number of even trifling variations.

Whatever may be the reason, the demarcation line between the black and white is seen to vary about the head and neck more frequently than elsewhere. We also got a pale or isabelline variety. In the Adélie Penguin the feathers of the occiput and neck can be raised to form a ruff or collar. With the erection of these feathers is associated the wide opening of the eyelids and the exposure of the white sclerotic of the eye-balls, giving the bird an appearance which we are apt to associate with fear. This is not so, but is intended to induce terror in others; but any great excitement will cause the erection of this crest, with every sign of rage in voice and attitude. There is no doubt that the Adélie Penguin is a quick-tempered and withal a very plucky bird. As one approaches the sitting birds hardly a male but begins to growl and glare with staring eyeballs and ruffling feathers and hardly a bird but will without hesitation attack the most aggressive biped disturber of its peace.

The black-throated bird, although its wanderings are limited strictly to the icy regions, is a regular emigrant within those limits. From March till the latter end of August, both young and old are scattered over the northern regions of the ice, where they spend the winter, within easy reach of food and open water. They are also, during this time, more or less gregarious in habit, though markedly less so than they are in the summer season. Individual birds have been known to wander, apparently lost, on the Great Ice Barrier some 60 or 70 miles from open water, but this was certainly accidental. The general migration southward from the pack-ice applies to the adults only and occurs about the middle of October. The general migration to the pack-ice north again takes place in two sections, that of the adults about the third week in January and that of the season's young a week or two later.

The size of a moulting bird, as the old coat loosens, is prodigious compared with the sleek and slim appearance of the newly-moulted one, for not

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only do the old feathers stand out at right angles to the skin, but the thick layer of fat in which the new feathers are embedded is still below the skin. As the new feathers develop this layer of fat diminishes, and the difference in the close fit of the glossy blue-black plumage and the old dishevelled loose brown coat is more than ever marked.

The downy plumage is carried for one month from December 15th to January 9th and is moulted between January 9th and 16th, and the ensuing juvenile white-throated plumage is carried for thirteen months from January 16th to February 15th of the following year. The next moult, to the black-throated adult plumage, follows between February 15th and March 7th.

It is possible that a year more is spent in the pack-ice after the adult plumage has been acquired, and that these are the black-throated birds which are seen in such numbers in the pack-ice in January, many hundreds of miles away from the business of the nesting colonies. If this be so it would postpone the commencement of breeding till the end of the bird's third year, and this is quite possibly the case. One thing is certain, that having assumed the livery of the adult, which is identical for male and female, by the month of February, they wear it without much deterioration throughout the winter in the pack. The moult in all stages of immaturity is autumnal, and being also an autumnal moult in the adult, it may be called post-nuptial.

Dr. Sharpe, in the Report on the Collections of Natural History of the "Southern Cross," published in 1902, says: "The nestlings are covered with silver-grey down, with a black head and face; the throat also is shaded with sooty-black. As the bird increases in size the silver-grey appearance gives place to sooty down, and a little black spot shows the position of the tail. The temperature taken alongside an incubating egg showed 72° F."

When fighting, the males stand erect and deal each other resounding blows with their flippers, first one then the other, with astonishing rapidity. When one is knocked down the beak of his opponent is brought into play with no slight effect. These fights lasted as long as a quarter of an hour, in fact, they were not terminated until one was completely conquered. The vanquished bird generally presented a pitiful appearance, being covered with gore and devoid of much of his plumage.

The method of feeding the young was interesting. The baby places its head into the open mouth of the parent and devours the food forced up into the throat;

PYGOSCELIS PAPUA.

(TÆNIATA.)

ROCK HOPPER.

(PLATE 31.)

PYGOSCELIS Wagler, Isis, March 1832, heft. III., col. 281. Type (by monotypy): *Aptenodytes papua* Forster.

APTENODYTES PAPUA Forster, Comment. Götting., Vol. III., p. 140, pl. 3, after May 15th, 1781: Falkland Islands.

Pygoscelis papua Gray, "Voy. Erebus and Terror," pl. 25, 1845; Ogilvie-Grant, Cat. Birds Brit. Mus., Vol. XXVI., p. 631, 1898 (pref. Sept. 30th); Alexander, Emu, Vol. XXVI., p. 137, Oct. 1926.

Aptenodytes tæniata Peale, U.S. Explor. Exped., Birds, p. 264, in or before Oct., 1848: Macquarie Island.

A Large Penguin, Fletcher, Emu, Vol. XXV., p. 212, Jan. 1926: Tasmania (Eaglehawk Neck).

Pygoscelis papua tæniata Mathews, Syst. Av. Australas., p. 10, 1927.

The Strange Penguin, Fletcher, Emu, Vol. XXVII., pt. 2, p. 118, Oct. 17th, 1927: Tasmania (Eaglehawk Neck).

DISTRIBUTION. Macquarie Island (breeding), Tasmania (casual). [The typical birds occur in Kerguelen, Heard and Marion Islands, Falkland Islands.]

Adult. Entire upper-surface bluish; fore-head black; a white triangle above and behind the eyes, meeting and forming a band, narrowest on the back of the head; lores, chin, sides of the face and throat slate-grey; remainder of under-surface, silvery-white; wings bluish with an edging of white on the edges, under-surface white with a bluish tip; tail of sixteen feather; eyes brown; bill reddish, with the culmen black; feet reddish. Total length 740 mm.: culmen exposed 50, from gape 80, wing 210, tarsus 25, tail 140. Collected on the 27th of May, 1909, by Capt. Davis in Lat. $54^{\circ} 43\frac{1}{2}'$ S. Long. $158^{\circ} 54'$ E. Macquarie Island.

The sexes are alike.

The immature have the chin and throat mottled.

Nest. A depression.

Eggs. Clutch two, roundish oval, whitish. Usual shell, 68-71 by 57-61 mm.

Breeding-season. October and November.

THIS bird visited Tasmania in March, 1925, and was seen and reported on by Miss. J. A. Fletcher, who made a further comment in 1927. From these accounts it would seem that this is a frequent visitor to Tasmania.

Order SPHENISCIFORMES.

Family SPHENISCIDÆ.

No. 44.

EUDYPTES SCLATERI.

BIG-CRESTED PENGUIN.

(PLATE 32.)

EUDYPTES SCLATERI Buller, Birds New Zealand, 2nd ed., Vol. II., p. 289, Dec. 1888 : Auckland Islands.

Eudyptes sclateri Buller, Birds New Zealand, 2nd ed., Vol. II., p. 289, Dec. 1888 ; *id.*, Proc. Zool. Soc. Lond., 1889, pl. ix., fig. 1 ; Iredale and Cayley, Emu, Vol. XXV., p. 5, pls. 1 and 2, July 1925 ; Mathews, Syst. Av. Australas., p. 10, 1927.

Catarrhactes sclateri Ogilvie-Grant, Cat. Birds Brit. Mus., Vol. XXVI., p. 640, 1898, pref. Sept. 30th.

DISTRIBUTION. Auckland Islands. Australia (?).

Adult. Feathers of the top of the head rather lengthened and of a deep glossy blue-black ; throat, sides of the face, back of the head and neck, deep glossy black with a slight purplish gloss ; mantle, back and rest of upper-parts deep slate-blue, each feather being pointed and glossy ; a broad golden straw-coloured line of feathers commencing on the lores, passing over the eyes and continued in the form of a lateral crest about 70 mm. in length ; upper-surface of flipper like the back with two rows of feathers on the inner margin white ; under-surface of flipper white bordered on the outer margin and at the tip and base with blackish, lower throat and entire under-parts white. Total length about 700 mm. : flipper 215, tail 115, tarsus 27, exposed culmen 60. Figured. Collected on Bounty Island in January, 1895.

The sexes are alike.

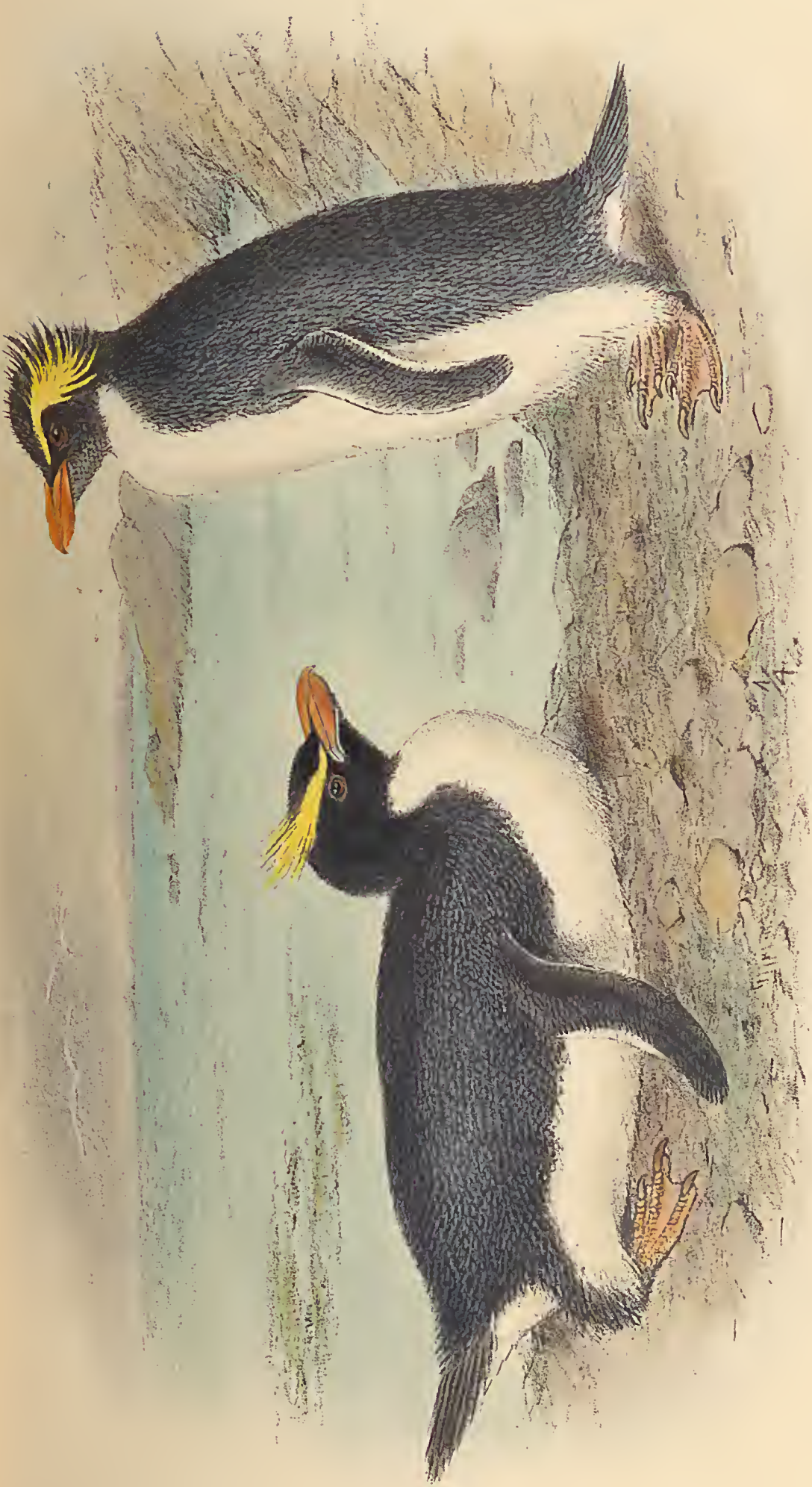
THIS bird has no doubt visited Australia at odd times. Nothing of its life history there has been recorded.

Witherby & Co

EUDYPTES CRISTATUS
(CRESTED PENGUIN)

EUDYPTES SCLATERI
(BIG-CRESTED PENGUIN)

H. Grönvold, del



EUDYPTES CRISTATUS.

(FILHOLI.)

CRESTED PENGUIN.

(PLATE 32.)

EUDYPTES Vieillot, Analyse Nouv. Ornith., pp. 67, 70, April 14th, 1816. Type (by subsequent designation, of Gray, p. 77, 1840): *Catarrhactes chrysocome* Auct.=*Aptenodytes cristata* Miller (for synonyms see my Check List Birds Austr., p. 2, Feb. 16th, 1920, and Manual Birds Austr., p. 10, March 9th, 1921).

APTENODYTES CRESTATA (*sic*) Miller, Var. Subj. Nat. Hist., pt.ix., pl. 49, 1784: Falkland Islands. Figured, Cim. Phys., pl. 49.

Catarrhactes chrysocome Ogilvie-Grant, Cat. Birds Brit. Mus., Vol. XXVI., p. 635, 1898, pref. Sept. 30th, and of most authors not *Aptenodytes chrysocome* Forster, Comm. Götting., Vol. III., p. 135, 1781, after May 15th, which is indeterminable.

Eudyptes filholi Hutton, Proc. Linn. Soc. N.S.W., Vol. III., p. 334, May 1879: Campbell Island, New Zealand.

Eudyptes serresianus Mathews, Emu, Vol. XVI., p. 184, Jan. 1917; *id.*, Check List Birds Austr., pt. 1, p. 2., Feb. 16th, 1920; Alexander, Emu, Vol. XIX., p. 296, April 1920; Mathews and Iredale, Manual Birds Austr., p. 11, pl. i., March 9th, 1921.

Eudyptes cristatus Iredale and Cayley, Emu, Vol. XXV., p. 4, pls. 1 and 2, July 1925.

Eudyptes cristatus filholi Mathews, Syst. Av. Australas., p. 10, 1927.

DISTRIBUTION. Southern Australian seas, from West Australia to Tasmania; New Zealand. Breeding on Campbell and Macquarie Islands.

Adult. General colour of the upper-surface glossy dark slate-blue, each pointed feather with black at the base; lores brownish-black; a golden-yellow eyebrow stripe commencing behind the nasal feathers, continued along the sides of the head and ending in a long lateral crest, the longest feathers of which measure 81 mm.: top of the head glossy blue-black, the feathers along the sides of the crown greatly lengthened (about 80 mm. in length), sides of face, chin and throat blackish-brown; remainder of under-surface pure white; upper-surface of flipper like the back, bordered on the middle of the inner margin with white, under-surface of flipper white, black at the base. Total length about 600 mm.: flipper 150, tail 107, tarsus 31, exposed culmen 50. Figured. Collected on Campbell Island.

The sexes are alike.

Nest. A depression.

Eggs. Clutch two, bluish-white, 75-80 by 45 mm.

Breeding-season. October.

THIS is another Penguin that is an occasional visitor to the southern parts of Australia.

Order SPHENISCIFORMES.

Family SPHENISCIDÆ.

No. 46.

EUDYPTES SCHLEGELI.

ROYAL OR MACARONI PENGUIN.

(PLATE 33.)

EUDYPTES SCHLEGELI Finsch, Trans. New Zealand Inst., 1875, Vol. VIII., p. 204, May 1876 :
Macquarie Island.

Eudyptes schlegeli Finsch, Trans. New Zeal. Inst., 1875, Vol. VIII., p. 204, May 1876 ; Mathews
and Iredale, Manual Birds Austr., p. 12, March 9th, 1921 ; Iredale and Cayley, Emu,
Vol. XXV., p. 6, July 1925 ; Mathews, Syst. Av. Australas., p. 11, 1927.

Catarrhactes schlegeli Ogilvie-Grant, Cat. Birds Brit. Mus., Vol. XXVI., p. 643, 1898, pref.
Sept. 30th ; Wilson, Nat. Antaret. Exped., Vol. II., Aves, p. 59, pl. XI., figs. 1 and 2,
1907.

DISTRIBUTION. Campbell Island, Macquarie Island (breeding), New Zealand, Tasmania (casual).

Adult male. General colour above dark glossy slate, each feather with a bluish-white middle ;
top of the head darker, feathers on the fore-head lengthened and forming a lateral crest, the
longest (measuring 75 mm.) being of a golden-orange and the shorter plumes black with the
terminal half golden-orange ; lores white tinged with golden-yellow ; cheeks, sides of the
face and entire under-parts white ; iris red-brown ; bill red-orange ; legs and feet pink.
Total length 777 mm. : exposed culmen 70, tail 100, flipper 193, tarsus 32. Figured.
Collected on Macquarie Island on the 22nd November, 1901.

The sexes are alike.

Immature. Rather like the above, with plumes only indicated ; throat and sides of the head greyish :
November 22nd, 1901.

Nest. A well-constructed circular wall of stones, edges raised and a good depression in the
centre.

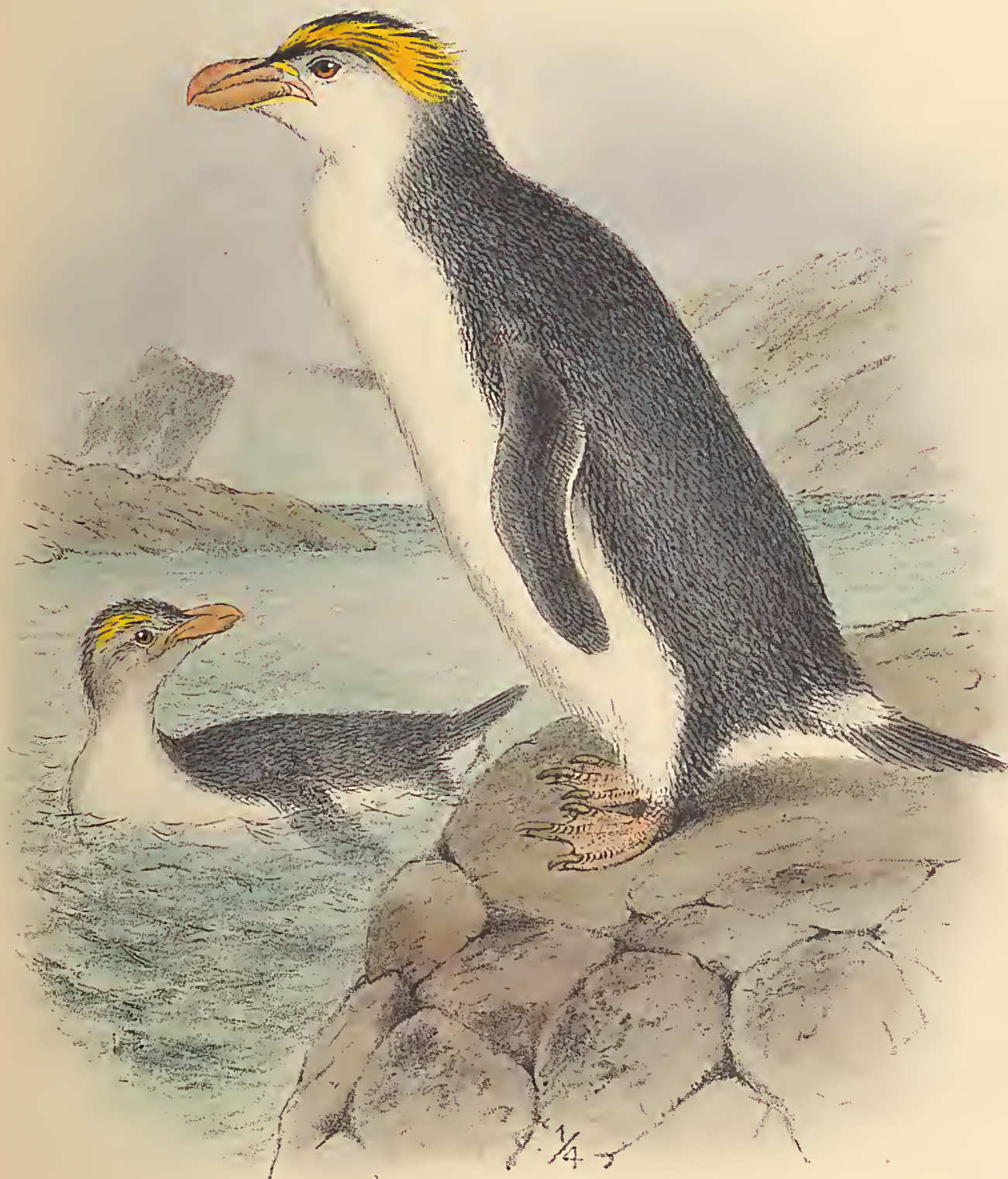
Egg. Clutch one, pyriform in shape, with the usual chalky-white shell, 75-85 by 55-62.5 mm.

Incubation-period. One month.

Breeding-season. September, October and November.

THE following is taken from Dr. E. A. Wilson's account as published in the
National Antaretic Expedition, Natural History, Vol. II., 1907.

This Penguin is a localised species and breeds only on Macquarie Island.
The rookery that we examined on November 22nd, 1901, was situated on a
shelving beach in Fisherman's Cove, on the eastern side of the island, not
far removed from the water's edge. It was in a very much drier spot than
that chosen by the neighbouring King Penguins, and considerably more



H. Grönvold. del.

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EUDYPTES SCHLEGELI
(ROYAL OR MACARONI PENGUIN.)

ROYAL OR MACARONI PENGUIN.

limited in size and extent. Definite nests had been made by each pair of birds quite close to one another, composed of grey pebbles, twenty to thirty in number, small and large, with water-worn bones picked up on the adjacent shore. They were well-formed structures with raised edges, circular, and with a good depression in the centre of each. The birds had already made good progress with their incubation, for in every nest we found an egg, and they were all too fully incubated to be useful as food. The male shares the labour of incubating with the female, and the process is said to be completed in a month. The eggs we took were about three parts incubated.

The whole process of incubating and chicken rearing by the Royal Penguin is comparable to that of the Adélie Penguin further south, but every stage takes place about a month earlier.

When we were on the spot in November no moulting birds were to be seen, and every bird was paired, nests made, and an egg laid to each pair of birds. Their condition was so uniform throughout that we could only conclude that the laying of eggs takes place, as in the Adélie Penguin, almost to the day throughout the rookery, and not over a considerable extent of time, as in the case of the King Penguin. Only two phases of plumage were seen in November. First, and by far the most numerous, were the fully adult birds with white throats and chins and long golden-yellow superciliary plumes. Secondly, there were a considerable number of yearling birds, with dark grey chins and throats and short golden plumes. Besides these were to be found a certain number with slight traces of grey persisting upon the throat; birds which, judging from the length of their plumes, were at least two years old, if the grey-throated birds were correctly considered yearlings.

The fully-developed plumes present a very grotesque appearance as they stand out on both sides of the head and frame the fierce-looking blood-red eyes and the large red bill. The birds looked like harpies cowering over their nests on our approach, swearing and growling in concert with the harsh and angry cries of their neighbours in a way which was almost deafening.

While engaged in incubating its eggs the bird squats in the same manner as the Adélie Penguin, right down upon its nest. There is no effort to hold the egg between the legs, and in no case was the egg lifted when we raised the bird from its nest. Yet the production of a single egg may be considered the first step towards what one may call the hyperpodial method of incubation employed by the King and Emperor Penguins, which, although more primitive than *schlegeli* in some respects, must be considered more highly specialised in this particular direction.

BIRDS OF THE AUSTRALASIAN SOUTH POLAR QUADRANT.

To recapitulate the life history of this Penguin, it appears that in January the birds begin to arrive at the island and continue to arrive till the end of March. The moult of the adult is in progress throughout February and March, each bird spending the three weeks necessary for the process on shore, fasting. From March to September presumably the birds remain at sea. In September they come again to land in numbers and prepare to nest. In September or October a single egg is laid in each nest, and the young are hatched out at the end of November. These remain on shore from December to the end of February, when, having shed their downy plumage, they take to the water and leave the coast clear for the moulting adults.



ALECTURA LATHAMI
(BRUSH -- TURKEY)

Witherby & Co

E. W. Frohawk, Lith.

Order GALLIFORMES.

Family MEGAPODIIDÆ.

No. 47.

ALECTURA LATHAMI.
(PURPUREICOLLIS.)

BRUSH TURKEY.

(PLATE 34.)

ALECTURA LATHAMI Gray, Zool. Miscell., pt. I., p. 4, 1831, Nov. 5th : Sydney, New South Wales.

Talegallus purpureicollis Le Souëf, Ibis, Jan. 1898, p. 51 : Cape York.

Alectura lathamii purpureicollis Mathews, Birds Australia, Vol. I., pt. I., p. 61, Oct. 31st, 1912.

At the quotation given I have worked up all that was known of this sub-species. Having Mr. Robin Kemp collecting for me at Cape York, I asked him to pass a painting made from his description of the head, wattles and feet, from a freshly-killed specimen. This I have had reproduced.

This sub-species differs from typical *lathamii* in having the skin on the lower neck of a different colour. The bill is black ; eyes yellowish-brown ; feet reddish-black. The whole of the face, head and upper neck is crimson, the face duller and darker and progressively becoming brighter and more vivid towards the neck, until when it meets the whitish collar it is of a bright livid-crimson. Lower neck white faintly tinged with blue and variegated sparsely with lemon-yellow blotches or markings, which are confined to the sides and front, and do not appear on the back of the lower neck. The loose skin or wattle is about the lower neck only, the chin and upper neck being tight, but showing an increasing fullness in progression downwards towards the lower neck. The width of the whitish band on the lower neck is, front 40 mm. ; sides 80 ; back 50.

AUSTROTURNIX OLIVII.

BUFF-BREASTED QUAIL.

TURNIX OLIVII Robinson, Bull. Brit. Orn. Club, Vol. X., p. XLIII., Feb. 28th, 1900: Cooktown, Queensland.

Turnix olivii Mathews, Birds Austr., Vol. I., pt. 1, pl. 17, Oct. 31st, 1910; A. J. Campbell, Emu, Vol. XXII., pt. I., p. 1, pls. 1 to 4, July, 1922.

Austroturnix olivii cœnensis Mathews, *ib.*, Vol. XLIII., p. 14, Oct. 27th, 1922: Coen, North Queensland (fig. Emu, Vol. XXII., pl. 1, (1922)).

DISTRIBUTION. Cooktown and Coen, North Queensland.

Adult male. Fore-part of head, middle of crown, and middle of nape dark lead-grey, the shafts of the feathers on the fore-head black and somewhat stiffened; nasal bristles numerous but short; a black band on each side of the crown and nape, with dark chestnut margins to the feathers; sides of face grey, freckled with whitish like the sides of the neck; mantle and back cinnamon-rufous with grey fringe, white sub-marginal streaks and broad black cross-bands to the feathers; scapulars similar but much more grey and less black; rump and upper tail-coverts cinnamon-rufous, the feathers slightly margined with grey; tail for the most part grey with a slight tinge of rufous; lesser upper wing-coverts drab-grey with blackish centres to the feathers; the median and greater series pale cinnamon, irregularly marked with blackish and dull white; bastard wing blackish-brown margined with white; primary-coverts also blackish-brown slightly paler at the tips; flight-quills dark brown somewhat paler at the tips and margined with white on the outer webs, more broadly on the primaries, the innermost secondaries similar in colour to the back; throat silvery-grey with white shaft-streaks; fore-neck and breast fawn-yellow tinged with grey at the sides of the abdomen; sides of body grey, some of the feathers tinged with rufous and marked with white; abdomen, thighs, and short under tail-coverts greyish-white, the long coverts of the last pale buff; axillaries and under wing-coverts grey; under-surface of flight-quills glossy-grey; lower aspect of tail also grey; eyes yellow; upper mandible dark brown, cutting edges and lower bluish-white; legs yellow. Total length 183 mm.: culmen 13, wing 100, tail 39, tarsus 23. Collected at Coen, North Queensland, on the 5th of February, 1922.

Adult female. Middle of crown, sides of crown, sides of face, sides of neck and hind-neck lead-grey, which is paler on the nape and more or less interspersed with cinnamon; the fore-part of the head darker than the crown, the feathers bristle-like in texture and inclining to blackish; a broad line of dark chestnut on each side of the crown and extending on the sides of the nape where some of the feathers are tipped with black; lower hind-neck, mantle back and scapulars cinnamon-rufous; some of the feathers on the scapulars are barred with black and edged with white; rump, upper tail-coverts and tail also cinnamon-rufous with olive-grey edgings to the feathers; lesser upper wing-coverts black intermixed with cinnamon and grey; median and greater series cinnamon with irregular markings of white and black, the latter more minutely; bastard-wing blackish fringed with white; primary-coverts also blackish slightly paler at the tips; flight-quills dark brown becoming paler at the tip and greyish-white along the margins of the outer primaries; innermost secondaries similar to the back but more coarsely marked

BUFF-BREASTED QUAIL.

with black and white; chin grey with silvery-white shaft-streaks; throat similar but somewhat darker; breast, sides of breast, and sides of abdomen ochreous-grey; abdomen cream-white; thighs similar but rather darker; under tail-coverts buffy-white; sides of body cinnamon-rufous with a tuft of grey feathers in the middle like the axillaries and under wing-coverts, the greater series of the latter tinged with cinnamon; under-surface of flight-quills glossy-grey; lower aspect of tail cinnamon-grey; eyes yellow; bill dull blue; culmen brownish; legs yellow. Total length 210 mm.: culmen 18, wing 109, tail 41, tarsus 26. Collected at Coen, North Queensland, on the 1st of February, 1922.

Nest. Ovate, with the entrance at the side; placed in a shallow depression in the ground in short fine grass, between a stool of a few stalks of long grass, and a small shrub; composed of soft, dry, narrow blades of long grass, and stalks of fine grasses. Outside measurements: width $5\frac{1}{2}$ inches, depth 5 inches, length 6 inches; entrance $3\frac{3}{4}$ inches wide by 3 inches deep; Inside: width 4 inches, depth 4 inches, length $4\frac{3}{4}$ inches. The depression in which the nest was placed was one inch.

Eggs. Clutch four. Roundish in shape, much compressed and pointed at one end, forming quite a dumpy pipiform shape. Ground-colour whitish, minutely speckled, spotted and blotched all over with markings of reddish-brown, bluish-grey and black, the last two colours being predominant. Shell fine, and the surface rather glossy. Measurements 28 by 23-24 mm.

Breeding-season. March.

GLOBICERA RUBRICERA.

RED-CERED PIGEON.

(PLATE 35.)

GLOBICERA Bonaparte, Comptes Rendus Acad. Sci. Paris, Vol. XXXIX., p. 1072, Dec. 11th, 1854. Type (by tautonymy): *Columba globicera* Wagler=*Columba pacifica* Gmelin.

GLOBICERA RUBRICERA Bonaparte, Comptes Rendus Acad. Sci. Paris, Vol. XXXIX, p. 1073, Dec. 11th, 1854: New Ireland.

Globicera rubricera Bonaparte, Comptes Rendus Acad. Sci. Paris, Vol. XXXIX., p. 1073, Dec. 11th, 1854; *id.*, Iconogr. Pigeons, pl. 39, 1857; Salvadori, Cat. Birds Brit. Mus., Vol. XXI., p. 178, 1893, pref. June 30th; Kershaw, Emu, Vol. XVIII., p. 239, pl. xxxv., April 1919; Mathews, Check List Birds Austr., pt. 1. p. 110, Feb. 16th, 1920; Kinghorn, Emu, Vol. XXIV., p. 289, May 8th, 1925; Mathews, Syst. Av. Australas., p. 45, 1927.

Carpophaga lepida Cassin, Proc. Acad. Nat. Sci. Philad., Vol. VII., 1854, p. 230, March 23rd, 1855: North coasts of Australia, error=New Ireland.

Carpophaga rubricera Gould, Birds New Guinea, pt. XIX., Vol. V., pl. 63, 1885.

DISTRIBUTION. Bismarck Archipelago only.

Adult. Top of head, sides of throat, sides of face, hind-neck, sides of neck, chin and throat dull fawn-colour; breast and sides of breast pale vinous becoming darker on the abdomen, lower flanks and under tail-coverts; thighs drab-grey; under wing-coverts ash-grey; under-surface of flight-quills dark brown; lower aspect of tail blackish-brown; lower hind-neck, sides of neck and mantle pale grey; back, scapulars, upper wing-coverts, inner secondaries, rump, and upper tail-coverts green with coppery reflections which become almost absent on the bastard wing, primary-coverts, rump and upper tail-coverts; inner webs of flight-quills blackish with greenish-blue margins on the outer webs; tail-feathers purplish-black edged with bluish-green on the outer webs. Total length of unmounted skin 430 mm.: wing 243, culmen and cere 29, tail 127, tarsus 35. Collected "by one of the officers of the surveying expedition on the North Coast of Australia. Locality?"

ON this plate I have figured *Globicera rubricera* Bonaparte, 1854, and *Charadrius hiaticula* Linné. In my opinion both of these are very doubtful records. On the label of the *Globicera* is written: "Sp. (?) procured by one of the officers of the surveying expedition on the North Coast of Australia. Locality?"

This was described by John Cassin in the December number of the Proceed. Acad. Nat. Sci. of Philadelphia, Vol. VII., No. VI., 1854, published March 23rd, 1855. After describing the bird he says under Obs.: "The



H. Grönvold. del.

Witherby & Co.

GLOBICERA RUBRICERA
 (RED-CERED PIGEON)
CHARADRIUS HIATICULA
 (RINGED PLOVER)

RED-CERED PIGEON.

only specimen of this splendid bird that we have ever seen is that above described, and which is one of the many highly valuable contributions to the Museum of the Academy made by Mr. Edward Wilson. It was obtained by him in Europe, and bears a label only indicating the locality, as we have given it above."

In the *Emu*, Vol XVIII, pt. 4, plate xxxv., April 1st, 1919, is a coloured figure of birds of this species procured from New Britain and the Duke of York Island. In the letterpress to this plate Mr. J. A. Kershaw shares my view that "it seems possible that a mistake has been made in the locality." Dr. Charles W. Richmond of the National Museum of Washington, D.C., also shares this view.

CALONECTRIS LEUCOMELAS.

WHITE-FRONTED SHEARWATER.

(PLATE 36.)

CALONECTRIS Mathews and Iredale, Ibis, July 2nd, 1915, pp. 590-592. Type (by original designation): *Puffinus leucomelas* Temm.

PROCELLARIA LEUCOMELAS Temminck et Laugier, Planch. Color d'Ois., Vol. V., livr. xcix., pl. 587, 1835: Seas of Japan.

Puffinus leucomelas Temminck and Schlegel, Fauna Japonica, Aves, p. 131, pl. 85, 1850; Salvin, Cat. Birds Brit. Mus., Vol. XXV., p. 370, 1896, pref. Dec. 16th; Mathews, Handl. Birds Austr., p. 16, Jan. 1908; Godman, Monograph Petrels, p. 72, pl. 21, March 1908.

Calonectris leucomelas Mathews and Iredale, Manual Birds Austr., p. 24, March 9th, 1921; Mathews, Syst. Av. Australas., p. 112, June 13th, 1927.

DISTRIBUTION. Japan to Celebes, Moluccas and New Guinea [Australia?].

Adult male. Mantle, back and scapulars brown, with pale edges and white bases to the feathers; wing-coverts blackish-brown, greater coverts and secondary-quills margined with white on the outer webs towards the tips; bastard wing, primary-coverts and quills blackish, the latter white on the inner webs at the base; upper tail-coverts ash-brown edged with white; tail-feathers dark brown; crown of head slate-brown with numerous white feathers intermixed; hind-neck darker and inclining to sooty-brown; fore-head, side of face and sides of throat brown, with white margins to the feathers, imparting a streaked appearance; throat and under-surface of the body, including the axillaries and under tail-coverts, white; under wing-coverts white, with dark shaft-streaks, some of the outer greater coverts ash-grey fringed with white; bill horn-colour; feet flesh-colour, the outer toe a little darker (in the dried skin). Total length 465 mm.: culmen 53, wing 307, tail 146, tarsus 50.

Adult female. Similar to the adult male.

Nest and eggs not described.

THIS bird has been included in the Australian List, but the record is too doubtful at present. I have had a coloured plate done in order that it may help observers, should the bird be collected.



H. Grönvold. del.

CALONECTRIS LEUCOMELAS
(WHITE-FRONTED SHEARWATER.)

Witherby & Co



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THALASSOICA ANTARCTICA
(ANTARCTIC PETREL.)

H Gronvold, del

Order PROCELLARIIFORMES.

Family PROCELLARIIDÆ.

No. 51.

THALASSOICA ANTARCTICA.

ANTARCTIC PETREL.

(PLATE 37.)

THALASSOICA Reichenbach, Nat. Syst. Vög., p. iv., 1852 (1853). Type (by original designation) :
Procellaria antarctica Gmelin.

Eipetes Forbes, Voy. Chall., Zool., p. 59, 1882 (fig. head). Type (by original designation) :
Procellaria antarctica Gmelin.

PROCELLARIA ANTARCTICA Gmelin, Syst. Nat., Vol. I., pt. II., p. 565, April 20th, 1789 : Antarctic Circle.

Antarctic Petrel Forster, Voy. round World, Vol. I., p. 108, 1777 (pref. March 1st) ; Latham, Gen. Synops. Birds, Vol. III., pt. 2, p. 400, 1785.

Procellaria antarctica Gmelin, Syst. Nat., Vol. I., pt. II., p. 565, April 20th, 1789.

Priocella antarctica Sharpe, "Voy. Erebus and Terror," p. 37, pl. 33, 1875.

Thalassoica antarctica Salvan, Cat. Birds Brit. Mus., Vol. XXV., p. 392, 1896 (pref. Dec. 16th, 1895) ; Sharpe, Rep. Coll. Nat. Hist. "Southern Cross," p. 143, 1902 ; Wilson, Nat. Antarct. Exped., Nat. Hist., Aves, p. 82, 1907 ; Mathews, Handl. Birds Austral., p. 16, Jan. 1908 ; Godman, Monogr. Petrels, p. 161, pl. 42, Sept. 1908 ; Mathews, Syst. Av. Australas., p. 116, 1927.

DISTRIBUTION. Antarctic Seas.

Adult male. Feathers surrounding the base of the bill greyish-white ; top of the head and feathers surrounding the eye dark greyish-brown ; back of the neck and upper mantle ashy-brown ; mantle, lower back, shorter upper tail-coverts and scapulars like the head ; longer upper tail-coverts pure white ; tail white, with a broad greyish-brown bar at the tip ; primaries ash-brown on the outer web and at the tip of the inner web ; remainder of the inner web white ; secondaries and secondary-coverts white ; throat rusty-white ; remainder of the under-surface white ; under aspect of wings white, bordered along the bend of the wing with ash-brown ; bill blackish-horn, the cutting edge of the mandible lemon-yellow ; eyes dark brown ; legs, toes and webs pale fleshy-grey, claws blackish. Total length 440 mm. : wing 320, tail 122, tarsus 43, culmen (exposed) 38. Figured. Collected on the 31st of December, 1898, at 159° 25' long., 62° 52' lat.

Adult female. Similar to the adult male.

FROM Dr. E. A. Wilson I take the following. The difference between this bird as seen in a museum and in its native habitat is very noticeable. The clean-moulted bird is very handsome, with head, back and wings deep chocolate-brown, and pure-white wing and tail coverts ; and after the autumn moult, when the young birds have gone north to the open ocean away from ice, one sees them in this dark plumage during the winter months between New Zealand and

BIRDS OF THE AUSTRALASIAN SOUTH POLAR QUADRANT.

Cape Horn. In November they are still dark; but when the nesting season is over and the summer sun has done its work, the richness goes entirely and a pale buff colour takes its place. Then comes the autumnal moult in January or February, and the birds take on a mottled plumage, as one by one the almost black-brown feathers make their way out amongst the faded feathers of the head and back.

We met the bird in November in 1901, when we first sighted ice, in 62° S. lat. and 140° E. long. Two or three followed us a long way to the north again, away from the ice, but left us five days before we sighted the Macquarie Islands. They were in full dark plumage.

On our next journey southward a dozen or more met us as we again encountered ice in January. They had been roosting on a berg and were in full moult, with primaries missing in the wings and a mottled plumage of buff and black-brown feathers intermixed. Throughout the ice-pack we had them with us, and on the 10th of January we saw them flying in a flock in a south-easterly direction down the coast of South Victoria Land. All that night and the following day we had flocks of them around us, some flying at great heights, turning and wheeling together at a given signal in contrast to the independent and irregular flight of a flock of Snow Petrels. All were moulting, as one could see by the missing primaries of the wings. Several were caught on threads. They had been feeding on small fish and squids, the beaks of which formed part of the contents of their stomachs. On January 12th we lost them for a while, and saw no more till we found them in exceptionally large numbers at the extreme eastern edge of the Great Ice Barrier. Here in S. lat. $76^{\circ} 50'$ and W. long. 158° we discovered King Edward VII.'s Land, and the unusual abundance of this bird may mean that they breed somewhere in the locality. There was no spot in sight, however, that could possibly have suited them; there were no rocky cliffs worth mentioning, and no land that was not buried in an undulating and almost unbroken sheet of snow and ice. Returning by this spot a few days later we were again surrounded by large numbers of the birds, but we lost them the next day entirely and as suddenly as we had before met with them on the same spot. They were not on passage, but were flying to and fro as though in the neighbourhood of their breeding place; more than this we cannot say. From that time onward for two full years in McMurdo Sound we did not see the bird, save once, when a single straggler passed the ship.

On our homeward journey, however, in 1904, we fell in with them on February 26th. We were in pack-ice, and on the 29th we saw large numbers and kept them with us as we passed between the Balleny Islands. They were not in flocks. Some were freshly moulted, but others had only just begun.

ANTARCTIC PETREL.

One or two were caught on threads and landed. We finally saw the last of them on the day that we crossed the Antarctic Circle coming north.

I have mentioned that between June 22nd and July 4th this bird was seen in considerable numbers every day in the South Pacific Ocean. This throws some light upon their movements during the winter and extends their range. They are not so strictly ice birds as they were supposed to be, since they leave the ice for the open ocean in the winter months.

Order PROCELLARIIFORMES.

Family PROCELLARIIDÆ.

No. 52.

PTERODROMA BREVIROSTRIS.

KERGUELEN FULMAR.

(PLATE 38.)

PROCELLARIA BREVIROSTRIS Lesson, *Traité d'Orn.*, 8th livr., p. 611, June 11th, 1831. No locality.
=Kerguelen Island.

Procellaria brevirostris Lesson, *Traité d'Orn.*, 8th livr., p. 611, June 11th, 1831.

Æstrelata kidderi Coues, *Bull. U.S. Nat. Mus.*, No. 2, p. 28, Nov. 1875: Kerguelen Island.

Procellaria unicolor Coues, *ib.*, as synonym of *kidderi* Coues, *ex* Gould.

Æstrelata brevirostris Salvin, *Cat. Birds Brit. Mus.*, Vol. XXV., p. 409, 1896, pref. Dec. 16th, 1895; Sharpe, *Rep. Coll. Nat. Hist. "Southern Cross," Aves.*, p. 148, 1902; Godman, *Monogr. Petrels*, p. 216, pl. 60, Sept. 1908.

Pterodroma brevirostris Selater, *Syst. Av. Ethiop.*, p. 12, 1924; A. J. Campbell, *Emu*, Vol. XXVI., p. 136, Oct. 1926; *id.*, *ib.*, p. 153, pl. 24, Jan. 1927; Mathews, *Syst. Av. Australas.*, p. ix., June 13th, 1927.

DISTRIBUTION. South Indian and Atlantic Oceans, Kerguelen (breeding) and Tristan da Cunha. Accidental to West Australia.

Adult male. Fore-head, top and back of the head dark slate-grey, each feather with an indistinct blackish shaft-streak, all the bases of the feathers being greyish-white, remainder of the upper-surface slate-grey with indistinct blackish shaft-streaks; tail-feathers a little lighter than the back; upper and under tail-coverts freckled with white; primaries and secondaries similar in colour to the back, wing-coverts similar but slightly margined with lighter grey, whole of the under-surface a little lighter tone of grey than the upper-parts; bill dark horn; eyes dark brown; feet and webs black. Total length 370 mm.: exposed culmen 26, wing 240, tail 94, tarsus 34. Figured. Collected at Greenland Harbour, Kerguelen Island, on the 25th of January, 1898.

Adult female. Similar to the adult male.

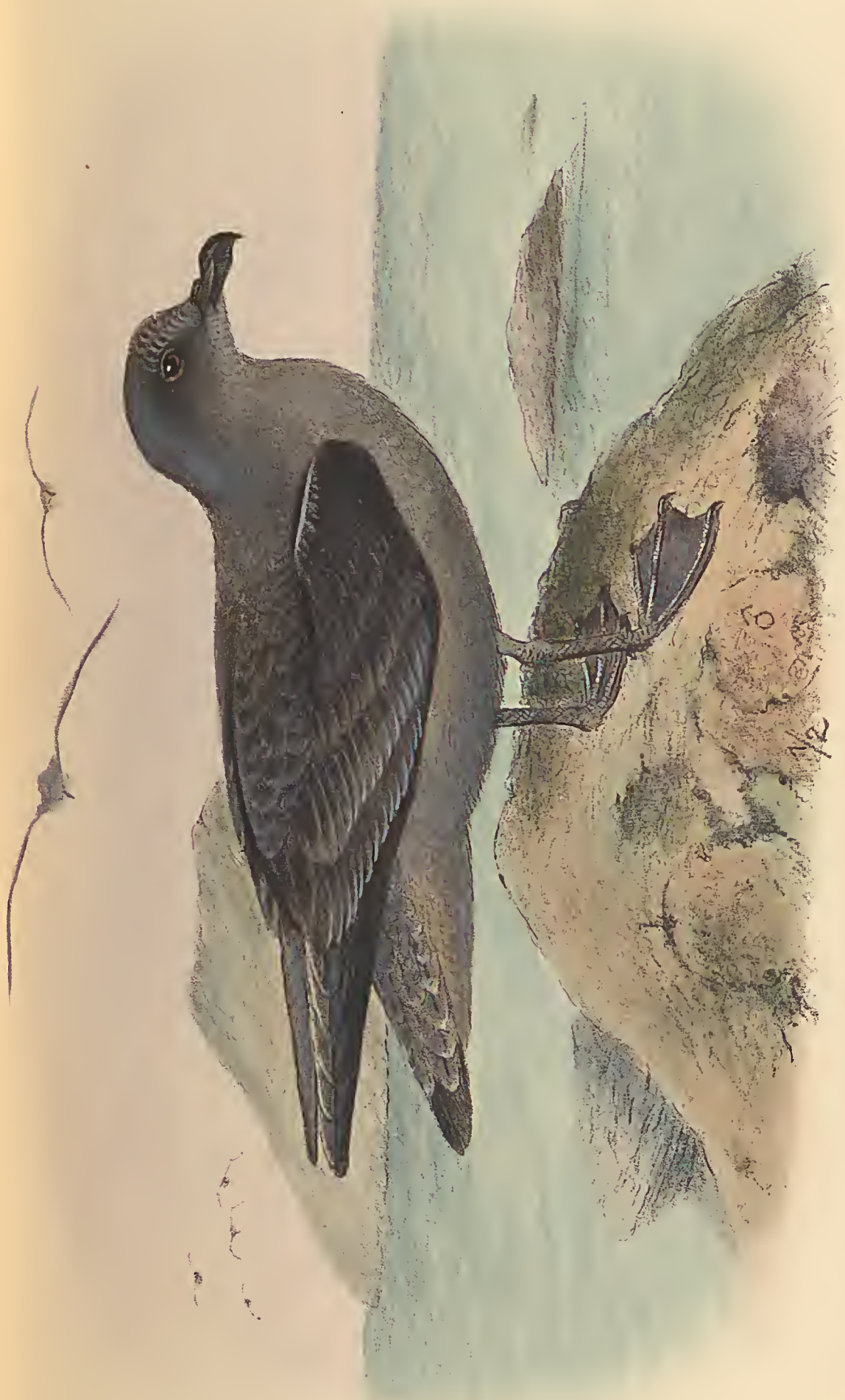
Nestling. Covered with sooty-brown down.

Nest. Composed of vegetable matter and placed at the end of a burrow.

Eggs. Clutch one: white, 50 by 38 mm.

Breeding-season. October, November and December.

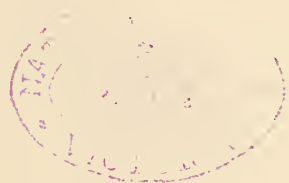
THIS species was added to the Australian List by Mr. A. J. Campbell. The bird was washed up dead on Cottesloe beach, Western Australia, on June 6th, 1926, after a storm.



H. Gronvold, del.

Witherby & Co.

PTERODROMA BREVIROSTRIS
(KERGUELEN FULMAR.)





F. W. Frohawk del

PAGODROMA NIVEA
(SMALL-BILLED SNOWY PETREL)

PAGODROMA CONFUSA
(LARGE-BILLED SNOWY PETREL)

Witherby & Co

1/2

Order PROCELLARIIFORMES.

Family PROCELLARIIDÆ.

No. 53.

PAGODROMA NIVEA.

(CANDIDA.)

SMALL-BILLED SNOWY PETREL.

(PLATE 39.)

PAGODROMA Bonaparte, Comptes Rendus Acad. Sci. Paris, Vol. XLII., p. 768, May 1858. Type (by monotypy): *Procellaria nivea* Forster.

PROCELLARIA NIVEA Forster, Voy. Round World, Vol. I., pp. 96-98, 1777 (pref. March 1st): lat. 52° S., long. 20° E.

Procellaria candida Peale, U.S. Explor. Exped., Vol. VIII., p. 295, in or before Oct. 1848: Arctic Regions (S. lat. 64°, long. 104° W.); Fig. Cassin, *ib.*, 2nd Ed., pl. 42, 1858.

Pagodroma nivea Sharpe, "Voy. Erebus and Terror," p. 37, pl. 34, 1875; Salvin, Cat. Birds Brit. Mus., Vol. XXV., p. 419, 1896, pref. Dec. 6th, 1895; Sharpe, Rep. Coll. Nat. Hist. "Southern Cross," Aves, p. 148, pl. x., figs. 1-3 (eggs), 1902; Wilson, Nat. Antarct. Exped., Vol. II., Aves, p. 88, 1907; Mathews, Handl. Birds Austral., p. 17, Jan. 1908; Godman, Monogr. Petrels, p. 254, pl. 73, April 1909; Campbell, Emu, Vol. XXIV., p. 77, July 4th, 1924.

Pagodroma nivea candida Mathews, Birds Austr., Vol. II., p. 177, July 31st, 1912; *id.*, Syst. Av. Australas., p. 123, 1927.

DISTRIBUTION. South Pole (Cape Adare to Australia [casual]).

Adult male. Entirely snow-white, with the shafts of the primaries and tail-feathers yellowish; a large black spot in front of the eye; bill black with a tinge of blue on the sides, and flesh-coloured along the cutting edges and at the gape; eyes very dark brown; legs, feet, webs and claws all dark bluish-black. Total length 343 mm.: culmen (exposed) 21, wing 267, tail 117, tarsus 33. Figured. Collected at sea, S. lat. 62° 52', E. long. 159° 25', on the 31st of December, 1898, in the pack-ice.

Adult female. Similar to the adult male.

Young about one-third grown. Clad in long fluffy down which almost conceals the feathers appearing on the wings and tail; the down is of a lavender-grey tint on the back and chest, darker on the head, and dull white on the abdomen (South Orkney Islands, January 28th, 1904).

Nest. At the end of a burrow two to six feet long, or in the crevices of rocks. The hen sits some weeks before she lays, and the place chosen may be either a few feet above the sea level or as high as 1,400 feet up a mountain side. Intruders are greeted with the customary Petrel vomit, which consists of half-digested food.

Egg. Clutch one. Bluish-white in colour. 50-56 by 36-41 mm.

Breeding-season. November (Cape Adare) to December (Robertson Bay). Young found in January.

BIRDS OF THE AUSTRALASIAN SOUTH POLAR QUADRANT.

FROM Dr. E. A. Wilson I take the following :—

This beautiful Petrel is more strictly confined to the limits of the ice than any other. We first met with it in our short visit to the pack-ice in S. lat. 61° to 62° and E. long. 140° [Adélie Land] on November 16th and 17th, 1901. But it was not till January 2nd, 1902, that we saw the bird in numbers, and then during the summer, cruising along the coast of South Victoria Land and the Barrier to King Edward's VII.'s Land, it rarely failed to keep us company. Nothing could be more beautiful and less apparently fitting for the regions of a storm-ridden climate, such as the Antarctic, than this little dove-like bird. It is the most constant companion of the ice and we never saw it away from its vicinity. It was abundant always in the pack-ice.

On January 9th, 1902, we saw many of these birds flitting about the summit of the most inaccessible cliffs of Cape Adare. Further down in Robertson's Bay its eggs had been taken by members of the "Southern Cross" Expedition in 1898 and 1899 and McCormick obtained the eggs on Cockburn Island in 1840. The bird is a great wanderer and was seen by several of our sledge parties on the Great Ice Barrier, some 70 miles to the south of open water.

After leaving Cape Adare we passed down the coast of South Victoria Land and when in sight of the Possession Islands were visited, on the 11th of January, by large flocks of Snow Petrels, which flew about the ship, mounting to very great heights above the mast-head, flying here and there independently in a mazy fashion, glittering against the blue sky like so many white moths or shining snow flakes.

When flying in the wake of the ship in this irregular manner it was possible to catch and haul them on board by flying lengths of strong thread from the halyards, the birds becoming so completely entangled by their wings that they were easily drawn in. Under these circumstances they gave vent to a guttural croaking sound, which seemed a most unsuitable note for such a dainty bird; this was followed by the regurgitation of a mucoid reddish-orange fluid, consisting of a mess of little shrimps, which was shot with some energy from the mouth and nostrils.

The food of the Snow Petrel consists almost entirely of *Euphausia*, a red shrimp-like crustacean, which abounds in the Southern waters. It lives there in countless numbers, and is thrown up by the breaking surf upon the edges of the icefloes, where the Snow Petrels hover with outspread wings to pick them up before the next wave comes to wash them off. Occasionally this diet is varied by a few small silvery fishes of the size of sprats, but the crustaceans form their staple diet.

The bird has few enemies. McCormick's Skua may be seen occasionally

SMALL-BILLED SNOWY PETREL.

chasing it; not for its life, for the chase is over when the contents of the Petrel's stomach have been surrendered. Apart from the Skua I believe it has no enemies. The Snow Petrel is a migrant within the limits of the ice-covered area, going northward with the sun in the autumn to frequent the northern limits of the ice belt, where it can obtain food in the open leads of water.

We had it with us during the whole of our journey northward along the South Victoria Land coast, and off the Balleny Islands on March 2nd, when it appeared in flocks of a score or more together. All were uniform in size and of the larger type; not one of the smaller type was seen, but as they seemed to be in flocks and on the move, one could not consider this to be characteristic of the locality. Most of the birds that we saw after the middle of February in 1904 were moulting, and a shortage of primaries could be seen in the wings; but in 1902 we obtained moulting birds on January 11th, so that the moult evidently begins quite early in that month.

The flight of this bird is exceedingly beautiful and dainty, and from the whiteness of its plumage it is very easily lost to sight on the snow-covered pack or ice-floe, appearing now for a second and now as suddenly disappearing, and there is something almost ghostly in the silent flight and sudden appearance and disappearance of this bird. Quite often one's attention is drawn to it by the flitting of its shadow on the snowy ground rather than by the bird itself. Though the flight is so beautiful, not only is its croaking guttural voice discordant, but its gait upon the snow is equally unbecoming. The legs are set widely apart, and the broad webbed feet are turned inwards, giving it precisely the same ungainly straddle-legged appearance that is familiar in the less elegant *Ossifraga gigantea*.

It is true that the feathering of the bird is white, but there is in the quills, particularly of the wings and tail, and in the basal parts of nearly all the feathers, quite a strong tinge of lemon-yellow, which no doubt results from the ingestion of so much of the bright orange-yellow pigment that characterises the crustaceans which form its staple diet. This pigment not only tinges the feathers, but colours the fat. The eyes, although apparently jet-black at a short distance, are found when examined closely to have a very dark brown iris.

This bird was added to the Australian List by Mr. A. J. Campbell in the *Emu*, Vol. XXIV., p. 77, July 4th, 1924.

Order PROCELLARIIFORMES.

Family PROCELLARIIDÆ.

No. 54.

PAGODROMA CONFUSA.

LARGE-BILLED SNOWY PETREL.

(PLATE 39.)

PAGODROMA CONFUSA Mathews, Birds Austr., Vol. II., p. 177, fig. head, July 31st, 1912: Cape Adare.

Pagodroma confusa Mathews, Birds Austr., Vol. II., p. 177, July 31st, 1912, with fig. of bill; *id.*, Syst. Av. Australas., p. 123, 1927.

DISTRIBUTION. Cape Adare; Antarctica.

Adult female. Entirely snow-white, with the shafts of the primaries and tail-feathers yellowish; a small black spot in front of the eye; bill black with a tinge of blue on the sides, and flesh-coloured along the cutting edges and at the gape; eyes very dark brown; legs, feet, webs and claws all dark bluish-black. Total length 365 mm.: culmen (exposed) 23, wing 300, tail 138, tarsus 38. Figured. Collected at sea in S. lat. 65° 3'; E. long. 161° 42' on the 12th of January, 1899. In the pack-ice.

Adult male. Similar to the adult female.

DR. Wilson gives the following measurements of the large-billed and small-billed form of *Pagodroma*. The largest were collected in the Ross Sea pack-ice and the smallest off Cape Adare.

			<i>confusa.</i>	<i>nivea.</i>
Culmen	..	..	26 mm.	18 mm.
Wing	..	..	290	245
Mid-toe	..	..	55	41
Total length	..	..	395	293
Tail	..	..	152	125
Tarsus	..	..	38	31
Inner toe	..	..	38	32

These two species had always been considered as identical, but now I think that ornithologists will admit two forms.

Order PROCELLARIIFORMES.

Family DIOMEDEIDÆ.

No. 55.

THALASSOGERON CHRYSOSTOMA.

GREY-HEADED MOLLY-MAWK.

Mathews, Birds of Australia, Vol. II., pt. III., p. 277, pl. 97, Sept. 20th, 1912.

In the above place I did not know of any authentic record of the breeding habits of this species.

In the July *Ibis* for 1923, p. 488, Mr. G. H. Wilkins gives the following from South Georgia :—

Young (just hatched) light grey down, slightly darker on the wings, becoming darker with age ; bill dark horn-colour ; iris light brown ; feet light grey.

Nest. Cone-shaped, 30-35 cm. [2 feet to 2 feet 1½ inches] high, about 30 cm. [2 feet] wide at the top and 50 cm. [2 feet 7½ inches] at the bottom ; built with moss and earth, lined with grass. The nests are used each year for breeding purposes, and are apparently used throughout the other seasons for places of rest.

Egg. One to a clutch. Dull white : average measurements 101 by 74 mm.

Breeding-season. December [January].

DIOMEDEA EPOMOPHORA.

ROYAL ALBATROSS.

(PLATE 40.)

DIOMEDEA Linné, Syst. Nat., 10th ed., p. 132, Jan. 1st, 1758. Type (by subsequent designation of Gray, p. 78, 1840): *Diomedea exulans* Linné (for synonyms cf. Birds of Austr., Vol. 2, p. 240, 1912, and Syst. Av. Australas., p. 129, 1927).

DIOMEDEA EPOMOPHORA Lesson, Ann. Sci. Nat. Paris, Vol. VI., p. 95, 1825: Campbell Island.

Diomedea epomophora Lesson, Ann. Sci. Nat. Paris, Vol. VI., p. 95, 1825; Mathews and Iredale, Manual Birds Austr., p. 57, March 9th, 1921.

Diomedea regia Buller, Trans. New Zealand Inst., Vol. XXIII., p. 234, 1891, May: Campbell Island. (Figured Buller, Birds New Zeal., 2nd, p. 40, top fig.); Salvin, Cat. Birds Brit. Mus., Vol. XXV., p. 443, 1896, pref. Dec. 16th, 1895; Mathews, Handl. Birds Austr., p. 19, Jan. 1908; Godman, Monogr. Petrels, p. 319, pl. 90, May 1910.

Diomedea epomophora epomophora Mathews, Birds Austr., Vol. II., p. 258, July 31st, 1912; Mathews, List Birds Austr., p. 41, Dec. 1913; *id.*, Syst. Av. Australas., p. 130, 1927.

DIOMEDEA EPOMOPHORA MCCORMICKI.

Diomedea epomophora mccormicki Mathews, Birds Austr., Vol. II., p. 261, July 31st, 1912: Auckland Island (Fig. Godman, Monogr. Petrels, pl. 90); *id.*, Syst. Av. Australas., p. 130, 1927.

DISTRIBUTION. Auckland Island [Antaretica?], Campbell Island to New Zealand and Australian Seas.

Adult. Snow-white on the head, neck, back, tail and all the under-surface, including the under wing-coverts and axillaries; on the lower back and rump a few narrow cross-bars may be seen, but it is probable these disappear with age; a few dark speckles are sometimes seen towards the tips of the outer tail-feathers; scapulars white at the base, the ends being cross-barred in some and black in others; wing coloration generally black, an indistinct olecranal patch of white being noticeable on the oldest specimen, the feathers along the bend of the wing showing white tips; primaries black, the inner webs white towards their bases; secondaries mostly white on the inner web; eyes very dark brown, almost black; bare eyelids jet-black; bill white, with a roseate or pinky tinge in life, yellowish horn-coloured on the terminal hook; legs and feet flesh-white. Total length 2,050 mm.: culmen 170, wing 660, tarsus 117, tail 206. Figured. Collected on Auckland Island on the 30th of November, 1840.

The sexes are alike.

Immature, with down still adhering, agrees in detail with the preceding; it has fewer white markings on the wing and the cross-bars on the rump and lower back are more pronounced, with longer, black ends to the scapulars; these seem the only noticeable differences; the tail is as white and the bill more dully coloured.

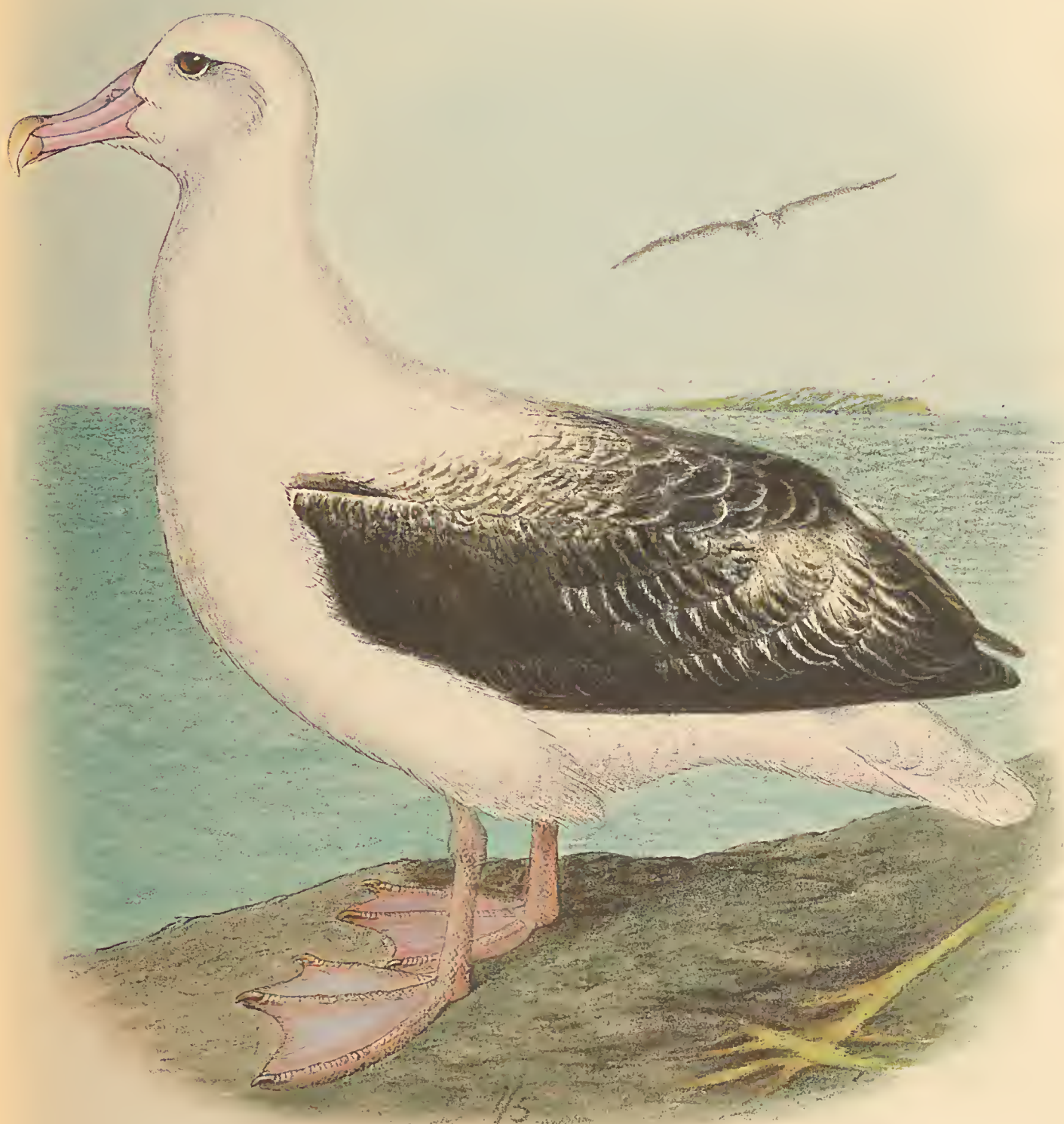
Nestling. Just commencing to lose the down, similar to the immature described; bill dark coloured; tail pure white.

Nestling. Covered with pure white down, thick and woolly in appearance.

Nest. Apparently like that of *Diomedea exulans rothschildi*.

Egg. White. Dimensions 126 by 79.5 mm.

Breeding-season. From December, when the birds commence to lay.

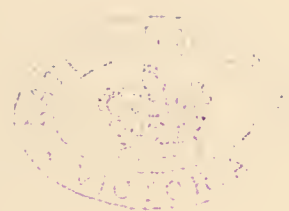


H. Grönvold del.

Witherby & Co

DIOMEDEA EPOMOPHORA
(ROYAL ALBATROSS.)







F. W. Frohawk del

PHOEBASTRIA FUSCATA
(SOOTY ALBATROSS)

Witherby & Co

Order PROCELLARIIFORMES.

Family DIOMEDEIDÆ.

No. 57.

PHŒBETRIA FUSCA.

(CAMPBELLI.)

SOOTY ALBATROSS.

(PLATE 41.)

PHŒBETRIA Reichenbach, Nat. Syst. Vögel, p. v., 1852 (1853). Type (by original designation):
Diomedea fuliginosa Gmelin=*Diomedea palpeolata* Forster.

DIOMEDEA FUSCA Hilsenbergh, in Forster's Notizen, Vol. III., No. 5 (49), p. 74, Sept. 1822:
Mozambique Channel.

Phæbetria fusca campbelli Mathews, Birds Austr., Vol. II., p. 304, Sept. 20th, 1912: Australian
Seas.

Diomedea fuliginosa Gould, Birds Austr., pt. xxxvi., Vol. VII., pl. 44, Dec. 1st, 1848.

Phæbetria fuliginosa Gould, Handb. Birds Austr., Vol. II., p. 441, Dec. 1865; Salvin, Cat. Birds
Brit. Mus., Vol. XXV., p. 453, 1896 (pref. Dec. 16th, 1895); Godman, Monogr. Petrels,
p. 363, pl. 103, May 1910.

Phæbetria fusca campbelli Mathews, Birds Austr., Vol. II., p. 304, Sept. 20th, 1912; *id.*, List
Birds Austr., p. 43, Dec. 1913; *id.*, Syst. Av. Australas., p. 133, 1927.

Phæbetria fusca Mathews, List Birds Austr., p. 43, Dec. 1913; Mathews and Iredale, Manual
Birds Austr., p. 48, March 9th, 1921.

DISTRIBUTION. Seas of the southern part of Australia.

Adult. General colour above and below sooty-brown, slightly darker on the top of the head;
blackish on the lores and above and behind the eyes; wings and tail blackish-brown;
shafts of the tail-feathers and primaries straw-colour; short feathers round the eye,
interrupted in front, white; bill black, the groove on the lower mandible long and deep
and filled with a yellow skin. Total length 790 mm.: culmen 115, wing 482, tail 250,
tarsus 73.

The sexes are alike.

Immature, nest, eggs and breeding-season not described.

THIS Sooty Albatross has been recorded by many observers at sea, near the
southern coast of Australia.

CATHARACTA MACCORMICKI.

SOUTH POLAR SKUA.

(PLATE 42.)

CATHARACTA Brünnich, Ornith. Boreal., p. 32, pref. Feb. 20th, 1764. Type (by subsequent designation of Reichenbach, Nat. Syst., p. v., 1852 (1853)) : *Catharacta skua* Brünnich.

Pomarinus G. Fisher, Nat. Mus. Naturg. Paris, Vol. II., p. 185, pref. March 6th, 1803. Type (by monotypy) : *Pomarinus fuscus* = *Catharacta skua*.

Megalestris Bonaparte, Comptes Rendus Acad. Sci. Paris, Vol. XLIII., p. 643, Sept. 1856. Type (by monotypy) : *Stercorarius catarrhactes* = *C. skua* Brünnich.

Bufagus Coues, Proc. Acad. Nat. Sci. Philad., 1863, p. 124, May. Type (by original designation) : *C. skua* Brünnich. Not Gray, Cat. Gen. Subgen. Birds, p. 129, 1855.

STERCORARIUS MACCORMICKI Saunders, Bull. Brit. Orn. Club, Vol. III., p. XII., Dec. 30th, 1893: Possession Island, Victoria Land.

Stercorarius maccormicki Saunders, Bull. Brit. Orn. Club, Vol. III., p. XII., Dec. 30th, 1893.

Megalestris maccormicki Saunders, Cat. Birds Brit. Mus., Vol. XXV., p. 321, pl. 1, 1896, pref. Dec. 16th, 1895; Sharpe, Rep. Coll. Nat. Hist. "Southern Cross," Aves, p. 166, pl. IX. (eggs), 1902; Wilson, Nat. Antaret. Exped., Nat. Hist., Vol. II., Aves, p. 64, pls. 12, 13, 1907; Mathews, Handl. Birds Austr., p. 22, Jan. 1908.

Catharacta maccormicki Mathews, Birds Austr., Vol. II., p. 495, Jan. 31st, 1913; *id.*, Syst. Av. Australas., p. 150, 1927.

Catharacta maccormicki maccormicki Mathews, Birds Austr., Vol. II., p. 496, Jan. 31st, 1913.

DISTRIBUTION. Victoria Land, Antaretica.

Adult male. Fore-head and top of the head greyish-brown, each feather tipped or margined with golden straw-colour; back and sides of the neck similar to the head but with the shafts of all the feathers light golden-yellow; mantle dark ash-grey, tipped with yellowish-white; back, rump, upper tail-coverts and tail dark umber-brown; scapulars and wing-coverts very dark umber-brown; primaries white on the basal half and brownish-black on the terminal half; secondaries uniform dark umber-brown; under-parts greyish-brown; some of the feathers, particularly on the sides of the face, chest and flanks washed with pale straw-colour; bill black; iris dark brown; legs black; claws black. Total length 570 mm.: wing 398, tail 145, tarsus 68, exposed culmen 47. Figured. Collected on Possession Island, Victoria Land, on the 12th of January, 1841.

Adult sexes alike; female, if anything, is larger.

Nestling. A ball of pale slate-grey fluff. Bill, legs and feet pale blue. The feet get blacker with age. The down is replaced by a dark and soft mouse-grey plumage, which gradually becomes more brown and uniform. The golden straw-coloured band on the neck is assumed at ten or eleven months.

Bill of the nestling, bluish-grey, gradually darkening to black as the bird attains to maturity. Iris dark brown at all stages.

Witherby & Co

CATHARACTA MACCORMICKI
(SOUTH POLAR SKUA)

H. Grönvold. del.



SOUTH POLAR SKUA.

Legs, toes and webs pale bluish-grey in the young when just hatched, gradually blackening from the extremities upwards, until, when the bird is full-fledged, the feet and legs are black except for a patch of bright blue just above the tibio-metatarsal joint. In the adult, wholly black. Claws black at all ages.

Nest. None made, just a shallow depression in the gravel.

Eggs. Clutch two normally, one sometimes; ground-colour greenish, buff or stone, marked, sometimes all over, but never heavily, with spots and blotches of a brown or brownish-black colour and underlining ones of light grey or light brown to purplish-grey. 66 to 73 mm. by 49-51 mm.

Incubation-period. Four weeks.

Breeding-season. December, January.

FROM Dr. E. A. Wilson I take the following :—

In the South Victoria Land quadrant of the Antarctic area the occurrence of McCormick's Skua is limited to the ice. Nor does it in any other part of the Antarctic seem to wander into more temperate regions, its place being taken in the sub-Antarctic area by the more robust form [*Catharacta lönnerbergi*]. Having accustomed ourselves to the appearance of the latter, which was with us day by day on our outward voyage for months, we had no difficulty in at once recognising the smaller and paler form of the ice-pack as a distinct species. From January 5th, when we met with it, onwards throughout the summer months, we had it always with us. Hardly a day passed in the summer but McCormick's Skua was noted, though not always in excessive numbers, except when we neared an Adélie Penguins' rookery. Then the Skua would always become abundant, and the bloody remains of Penguin chickens would be sufficient testimony to the nature of its needs.

The variety of colouring in this Skua was very noticeable at Cape Adare. The colour of the head, neck and breast varies from a very light buff, or almost white, to a dark brown. Everywhere on the higher slopes the bird was nesting, and young of all stages, as well as incubated eggs, were taken on January 9th.

We noticed it sleeping as it squatted on the ice-floes, from 2 a.m. till 7 in the morning, and a trait in the bird which we found to be very characteristic was the habit of settling, the one just ahead of its mate, both with outstretched wings and head well up, vociferating with loud and rapidly repeated cries before closing up the wings. Their habits are in every way like those of other Skuas, and having no other Gulls to attack, as their northern relatives, they content themselves by attacking one another or the smaller Petrels on the wing till the weaker disgorges what he has eaten.

Again in Granite Harbour, on the coast of McMurdo Sound, we found them, nesting, with young and even eggs, though so late as January 20th. On February 9th along the Barrier they still had nestlings in down.

BIRDS OF THE AUSTRALASIAN SOUTH POLAR QUADRANT.

At the end of March they began their migration northward, and finally disappeared on the 30th, to be seen no more till the following spring.

This Skua is of a sociable disposition, notwithstanding its cannibal tendencies, feeding, nesting and basking in the sun in groups. It is, moreover, a very cleanly bird, and repeated search failed to reveal an external parasite of any kind. It is particularly fond of bathing in the thaw-water pools along the hills where the snow is melted by the heat absorbed from the sun's rays by the adjacent rocks. Round and in these pools a group of Skuas might always be found. In the adjacent snow their tracks are found, and here and there a pattern in the hardened surface that might puzzle any one who had not watched them there. Just ahead of two footmarks is a fan-shaped series of linear scoop-marks, made by the birds beak as it squats comfortably on the snow and proceeds to satisfy its thirst by eating it.

The Skua has, no doubt, good sight, but its sense of smell must be little short of marvellous, having come 150 miles up wind to the killing of a sledge dog.

On March 5th, in McMurdo's Sound, we shot the first of the year's brood upon the wing. It had a straw-coloured ring on the neck very imperfectly marked and was otherwise very dark all over. Its legs were piebald, black and pale bluish-white.

McCormick's Skua chooses for its nesting site the northern or north-eastern face of some gravel-covered hillside, talus, or moraine cone, where the snow has either never settled on account of the winter winds, or from which it has been banished by the summer sun. We were able to inspect a score or more of their nesting colonies. They breed almost invariably in groups or colonies, with the nests only sufficiently widely separated to avoid unnecessary collision, which between birds of such strong thieving and criminal tendencies leads to awkwardness. Often the colony is situated close to, and even mingling with, the rookery of Adélie Penguins. This is the case at Cape Adare, where the Skuas nest in the scree and upland heights of the higher ground in close companionship with the Adélie Penguins that choose the high ground for their nests. A thousand feet above the moraine flat at sea level, where the majority of the Penguins nest, may be found in close proximity both Skua's and Penguin's nests with eggs and young. Again, at Cape Crozier, the Skuas were collected in a nesting colony on the *débris*-strewn slopes of Mount Terror, overlooking many thousands of Adélie's nests. So also at Wood Bay and at Cape Royds. The last-named rookery, one of the smallest Adélie Penguin rookeries we saw, was, strange to say, the largest of all the Skua's breeding colonies. Literally scores

SOUTH POLAR SKUA.

of nests could be discovered during a day's tramp over the rocky cape. Nowhere flat, this little peninsula was extremely rugged, both from the irregular weathering of a hard volcanic rock, and from the fact that over it has run at some long-distant period a huge ice-sheet, which has scooped it out into little hills and valleys and terraced it with moraine heaps. Each of those little hills or its adjacent valley was occupied by a pair of Skuas and each little rise overcome in a morning's walk from the camp laid one open to the noisy attention of another pair.

Round and round one's head the bird wheeled with a shrieking clatter, every now and again dashing down as though to strike. From time to time the blow took effect, and sometimes took one's cap off. Occasionally one might be surprised by a sudden blow on the forehead, but always as far as I could judge, without exception, it was given with the wing, and the claws were never used in the attack. While her partner was thus doing his part to frighten off the intruder, the sitting bird was loudly and persistently advertising the exact position of the nest, nor would she leave her post till we had come, sometimes, to within a yard or two.

The bird's cry is much like that of other Gulls, a loud and anxious, rapidly repeated cry, and very harsh. But the cry of the fledgling is very different. At Cape Adare I thought for some time that there must be a bird of the Sandpiper type about, for I constantly heard a liquid, melancholy, trill. By degrees, however, it brought me to a fledgling Skua, which was just beginning to use its wings for flight. I saw it whistling with a most musical note, wholly unlike the harsh cry of the adult.

The bird makes no attempt at concealment, though its colour as well as the colour of its eggs might be considered to be specially adapted to the nature of the ground, but with such habits as the Skua's there is obviously nothing in it. Even when the bird is away from its nest, one has but to climb a little rocky hillock, and somewhere in the hollows under one's eye will be apparent two eggs in a shallow scooped-out nest, easily visible even at a distance of ten or twenty yards. We never found more than two eggs in a nest, and in a certain number of cases in every rookery one egg is considered sufficient for incubation, the other doubtless having been stolen by a marauding neighbour. In many cases there is to be found in company with a normal egg, another with a much thinner shell and a pale bluish ground, but with little or no marking; this bluish colour soon disappears and is replaced by a buff or brownish-yellow tone in Museum specimens. Sometimes a thin-shelled egg may be ringed round the upper third by minute and crowded dots or speckles, but be lacking in the characteristic blotches of the normal egg.

BIRDS OF THE AUSTRALASIAN SOUTH POLAR QUADRANT.

The chick emerges with a well-developed egg scale on the beak, which it sheds in a day or two. It is a mere ball of pale slate-grey fluff, with pale blue beak, feet and legs; the grey down has much more blue in it than buff.

The paired adults are very friendly and have an obvious mutual care for one another and their chicks. The chicks were able to run at once on emerging from the egg, and the two young ones soon get separated from one another. The parents seem to know from the first that too much care and coddling will unfit them for such a rigorous climate. Consequently, one rarely sees the parent sitting on the chicks. She will be somewhere close to them, but they themselves will be generally some feet away from her, sunning themselves or taking shelter under the lee of a neighbouring rock. A few days after hatching the chicks fight tooth and nail with one another over some trivial bit of food, locked each to the other by every claw and fighting with loud squeals as they use their tiny beaks. They are not fed, as are so many birds, directly from the parent's bill or pharynx, but from the first they pick up for themselves, and I have seen the parents put bits of regurgitated fish and crustaceans on the ground for them to peck, thus treating them exactly as a fowl of the farmyard treats her chicks.

It is a noticeable fact in connection with this bird that only one of the two hatched in a nest survives. As they separate the mother is engrossed with one, the other wanders out of reach and is sooner or later snapped up by a hungry neighbour.

From the end of October to the beginning of April may be considered the six summer months given up by this bird to the business of reproduction. It inhabits during this period the most southerly part of the globe that can by any bird or beast, including man, be looked upon as habitable at all. No bird goes farther south than this, and very few as far. When the young were well feathered and fully capable of looking after themselves, they appeared with their elders round the ship in search of scraps and refuse. They are easily known by their dark uniform plumage. They have not got the bleached and whitened feathers that give their elders at the end of summer a characteristic hoary look, nor have they the straw-coloured ring round the back of the neck that becomes prominent in the second year and increases then with each year. The changes in plumage from the slate-grey downy nestling to the adult are much as follows. The first thing noticeable before the feathers of the wing are properly developed is a gradual blackening of the pale blue feet from the claws upwards, a blackening which gradually creeps up the toes and webs with a definite line of demarcation, extending by degrees till the feet and legs are black to the feathers

SOUTH POLAR SKUA.

at the tibio-metatarsal joint. Here, in the young just about to take the wing, there is still a bright blue patch of skin, but by March the legs and feet are black all over. The down has by this time been exchanged for a uniformly dark and soft mouse-grey plumage, which gradually becomes more brown by the removal, apparently, of the soft loose ends of the barbs by wear and tear. The bird, now in its first year's plumage, has no trace whatever of the golden straw-coloured band upon the neck; this begins to appear at about the age of ten or eleven months.

The Skua's real harvest begins as soon as the Adélie Penguin lays its eggs. They even rob their own kind. When the Adélie Penguins have hatched their eggs the Skua has least trouble in procuring food. Hanging round the rookery, with the unmistakable look of a thief, the Skua will run up to a chicken of the Adélie Penguin, almost as big as himself, drag it away and gradually worry it to death. The Penguin chick pipes his loudest, but the old birds standing round take very little notice. The adults weigh about one pound each.

The eggs of *C. lönnbergi* from Macquarie

Islands measure .. 75-81 by 50-54 mm.

C. maccormicki from McMurdo

Sound 66-73 by 49-51 mm.

Order LARIFORMES.

Family STERCORARIIDÆ.

No. 59.

CATHARACTA ANTARCTICA.

SOUTHERN SKUA.

LESTRIS ANTARCTICUS Lesson, Traité d'Orn., p. 616, June 11th, 1831: Falkland Islands.

Megalestris maccormicki A. J. Campbell, Emu, Vol. XXIV., p. 77, July 4th, 1924.

Catharacta antarctica, *id.*, *ib.*, p. 119, Oct. 1st, 1924.

Adult. Feathers at the base of the fore-head whitish-buff; crown of the head, occiput and nape ash-brown, tipped with brownish-white; feathers round the hind-neck paler than the head and with the shafts and tips whitish-buff; remainder of the upper-surface dull chocolate-brown, all the feathers bordered at the extremity with whitish-buff, caused by wear and bleaching, all the feathers being much truncated by wear—a few new dark chocolate-brown feathers are making their appearance on the mantle; quills dull chocolate-brown with the basal half of the inner web white; throat, sides of the neck and fore-neck dull greyish-brown with the tips buffish-white; remainder of the under-surface warm greyish-brown; under wing-coverts and axillaries like the chest. Total length 560 mm.: culmen 54, wing 375, tarsus 67. Queenscliff, Victoria, taken by N. Batchelor.

THE above description is taken from the Australian shot specimen. The data is not satisfactory. It is *antarctica*, but how did it get to Victoria?

No bird should be placed on a List of any country till it proves its right. Any doubt on its authenticity should make scientific writers most careful.

I am indebted to Mr. J. A. Kershaw for sending me over the specimen described above.

CHARADRIUS HIATICULA.

RINGED PLOVER.

(PLATE 35.)

CHARADRIUS Linné, Syst. Nat., 10th ed., p. 150, Jan. 1st, 1758. Type (by tautonymy):
Charadrius hiaticula Linné (cf. Mathews, Birds Austr., Vol. III., pt. II., p. 123, May
 2nd, 1913).

CHARADRIUS HIATICULA Linné, Syst. Nat., 10th ed., p. 150, Jan. 1st, 1758: Sweden, Europe (*ex*
 Fauna Svec., No. 159, 1746).

Charadrius hiaticula Linné, Syst. Nat., 10th ed., p. 150, Jan. 1st, 1758 (also spelt *hiaticola*);
 Hartert, Vögel der Paläarkt., Fauna, Vol. VI., p. 1530, Aug. 1920.

Charadrius torquatus Forster, Synopt. Cat. Brit. Birds, p. 26, Dec. 1817: British Islands.

Ægialitis septentrionalis C. L. Brehm, Handb. Naturg. Vög. Deutschl., p. 548, (pref. July) 1831:
 "From Iceland to Kiel, along the sea coasts and shores of the inland waters," Europe.

Hiaticula annulata Gray, List. Gen. Birds, p. 65, April 1st, 1840, new name for *hiaticula*.

Hiaticula arabs Heuglin, Ornith. Nordost-Afrika, Vol. II., pt. 1, p. 1026, 1873, after April 1st,
 as synonym of *Charadrius hiaticula* Linné, *ex* Lichtenstein, Nomencl. Av. Mus. Berlin,
 p. 94, 1854, *nude* name.

Ægialites hiaticuloides Heuglin, *ib.*, as synonym of *Charadrius hiaticula* Linné, *ex.*, *id.*, Syst.
 Ubers. Vög. Nordost-Afrika, p. 56, 1856.

Ægialites auritus Heuglin, *ib.*, *ib.*, *ib.*

Ægialites hiaticula Dresser, Birds of Europe, Vol. VII., p. 497, pl. 525, 1876; Sharpe, Cat. Birds
 Brit. Mus., Vol. XXIV., p. 256, 1896.

Charadrius hiaticula major Seebohm, Hist. Brit. Birds, Vol. III., p. 20, 1885: British Islands.

Charadrius hiaticula vulgaris Hartert, Vögel der Paläarkt., Fauna, Vol. II., p. 1532, Aug. 1920,
 as synonym of *Charadrius hiaticula* Linné, *ex* A. E. Brehm, Verz. Samml., p. 11, 1866,
nude name.

Charadrius hiaticula arenarius Hartert, *ib.*, *ib.*, *ib.*

Charadrius hiaticula latifasciatus Hartert, *ib.*, *ib.*, *ib.*

Ægialitis hiaticula tundrae Lowe, Bull. Brit. Ornith. Club., Vol. XXXVI., p. 7, Dec. 3rd, 1915:
 Yen-e-say, East Siberia.

Charadrius flavirostris Mathews, Austral. Av. Rec., Vol. V., Nos. 2 and 3, p. 44, Feb. 21st, 1923.
 Substitute name for *Charadrius hiaticula* Linné, *ex* Pontoppidan's Danske Atlas, p. 625,
 1763, *nude* name.

DISTRIBUTION. Europe, Africa, Asia and south to New Guinea (Australia?).

BIRDS OF THE AUSTRALASIAN SOUTH POLAR QUADRANT.

Adult male. Fore-part of head, eye-ring, sides of face, lores and base of fore-head black like the band across the fore-neck, which extends round the hind-neck where it becomes narrower; hinder crown, nape, back, wings and tail sepia-brown; scapulars also sepia-brown, margined with white on the outer webs; outer edge of wing white; bastard wing, primary-coverts and flight-quills dark brown, inclining to black towards the tips of the primaries; tips of the greater upper wing-coverts white like some of the secondary-quills, the sub-apical portion of the shafts of the primaries white like a portion of the outer webs on some of the feathers; base of tail like the back, becoming blackish towards the tip, the outer feathers tipped with white which increases in extent towards the outermost which is entirely white; sides of crown, a band across the fore-head and a band on the hind-neck white like the breast, abdomen, thighs, sides of body, under tail-coverts, axillaries and under wing-coverts; margin of wing below spotted with pale brown; under-surface of flight-quills silvery-grey, becoming darker towards the tips; lower aspect of tail similar to its upper-surface. Total length 184 mm.: culmen 13, wing 131, tail 60, tarsus 25. Figured. Collected at Long Bay, New South Wales, on the 30th of August, 1908.

Adult female. Similar to the adult male.

Chick. Above sandy brownish-grey, with blackish spots to the tips of the down feathers; head a little lighter than the back, with a blackish-brown stripe down the middle of the feathers; a narrow blackish band encircles the head reaching as far as the eye, followed by a wider white one which joins the white throat, which is continuous with the wholly white under-surface; fore-head white; base of bill yellow, remainder blackish-brown. Next stage: Similar, but more uniform above, of a lightish-brown mottled slightly with sandy-whitish spots; sides of the breast with a large brownish patch, which forms an almost complete band; throat more greyish than in the above stage; remainder of under-surface white. In the next stage the bird is very similar, but the feathers of the upper-surface are fringed with sandy, and in the next stage the sandy edges of the feathers on the back and head are whitish and the blackish band below the white nape band is distinct as in the adult.

Nest. Just a depression in the sand or soil.

Eggs. Clutch four, pyriform in shape; ground-colour stone. Marked all over fairly evenly, but sometimes more at the larger end, with varying ringed markings or spots of blackish-brown with underlying ones of lavender. 33-38 by 24-26 mm.

Breeding-season. April, May (Europe).

THIS bird has been recorded for Australia and the above description is taken from the Australian shot example. As there is no original collector's label on the skin, I am just describing the bird and giving the synonymy.

HETEROSCELUS INCANUS.

WANDERING TATTLER.

Mathews, Birds of Australia, Vol. III., pt. 3, p. 211, pl. 152, August 18th, 1913.

At the place given above I did not know of the nest and eggs of this species. But in the *Auk*, Vol. XLI., No. 2, April, 1924, pp. 231-235, pls. xvi.-xviii., Mr. Olaus J. Muric gives this information:—

On June 1st, 1922, I was hunting for grizzlies in the Alaska Range at the head of Delta River, and while coming down Phelan Creek, saw a dull slate-coloured bird fly by and perch on a rock at the edge of the turbulent water, at some distance . . . a Wandering Tattler, which I had not expected to find high in the mountains.

This species was not observed again until July 9th in the same year, when the first evidence of nesting was found. This was on Jennie Creek, a small tributary of Savage River, in another part of the Alaska Range. On that date a downy young was collected . . . The adult was not collected for several days, in the hope of finding more young, but on the 16th this bird, which proved to be a male, was taken. I had seen the bird a number of times before the young one was found. Whenever I came near it the parent met me, scolding from a perch on a rock, driftwood stump, or the bare limb of a tall willow. Finally, on the date mentioned, I spied the little grey youngster running away over the gravel bar.

A few days later two more adults were seen on upper Savage River and one on Sanctuary River, a stream running parallel with the Savage.

In the summer of 1923 work was resumed in the Savage River district. . . . On June 3rd, during a hasty visit to the place, three different Wandering Tattlers were observed along the gravel bars. All scolded at my approach and I hunted enthusiastically for nests, but found none. In one instance after a period of excited scolding the bird rose high in the air and flew away to some distant point. I concluded that there were probably no nests and that the birds were merely interested in a prospective nesting site. The following day I saw another bird in Jennie Creek as I returned to Fairbanks.

BIRDS OF THE AUSTRALASIAN SOUTH POLAR QUADRANT.

A serious flood on the Nenana River delayed us so that it was the end of June before we could move into the mountains for the summer work. On June 30th . . . started for Savage . . . a Wandering Tattler was seen in the distance on lower Jennie Creek.

The following day, July 1st, we continued up Savage River . . . About noon . . . suddenly called out to me, "Is that one of your birds?"

I turned and saw a Wandering Tattler flying away . . . We . . . spied the nest and eggs a short distance to the rear . . . the bird returned and settled on the nest. Several photographs were then taken of the bird on the eggs, the last one at a distance of about 10 feet or less. The nest and eggs were then taken and carried to our camping ground.

All our observations indicate that this nesting site is characteristic; that the Wandering Tattler prefers the gravel bars of mountain streams, as typified by Savage River. Those rivers are rapid and split into numerous channels, sometimes in an intricate network over the gravelly valley. This nest was found on Savage River about five miles above the mouth of Jennie Creek at an elevation of about 4,000 feet. It was so compact that I had no difficulty in picking it up and transporting it to camp.

Chicks (two or three days old). Under-parts dull white with a faint indication of greyish on upper breast and lower fore-neck; upper-parts pale grey, with a very slight suggestion of buff on wings, rump and tail, more evident in the fresh specimens than in the skin; upper-parts narrowly irregularly and indistinctly barred with blackish with dull black loreal and postocular streaks, and with irregular black spots on hind pileum. Tarsus and upper part of toes dull glaucous-green, the under-surface of foot olive-yellow; bill dull glaucous-blue.

Nest. Placed on a gravel bar about 30 feet from the nearest water, and was sunk in a shallow depression in the gravel. It was well built, unusually elaborate for a shore-bird. It was composed principally of fine roots carefully woven into a firm structure, including a number of twigs around the edges. Small bits of twigs and some dry leaves had been used for lining. The diameter of the nest to the edges of the finely woven body was about five inches, but of course some of the twigs extended much farther.

Eggs. Clutch four, pointed ovate in form, the general coloration of which reminds one of Crow's eggs. The ground colour is pale olivine to glaucous and pale glaucous, spotted with vandyke brown and burnt umber, in places becoming dull black, again lightening to verona brown, with scattered spots of light quaker drab. The larger spots are massed at the larger end of the egg, in one instance grouped in a wreath. Measurements 43.3 to 44.5 mm. by 31.5 to 32.6 mm.

Breeding-season. June, July.

At least three pairs of Wandering Tattlers nested on Savage River, perhaps more; that is to say, three nests, for both adults were never seen together and it may be that only one looked after incubation and care of the young. However, the adult secured with the downy young . . . was a male, and one would ordinarily expect the female to remain with the nest also. This is a point which was not determined.

WANDERING TATTLER.

As we passed up and down the river during the summer the birds were observed on many occasions, both adults and young. Near our camp was a muddy spring, a caribou lick, from which flowed a remarkably clean, cold brook. A Wandering Tattler often flew by our tent to this spring, evidently to feed. Apart from this instance the birds were invariably found on the bars, usually near the water's edge.

Whenever I approached the home grounds of a Wandering Tattler he would fly to meet me and would scold excitedly, uttering a vigorous *deedle-deedle-deedle-deedle-dee*, with variations which I failed to record minutely. At such times a whistled "cheep," imitating a chick, would bring the excited bird within a few feet and photographs were secured in this way. On July I saw a young bird, still downy. On August 8th one young bird was fully feathered and was seen on several occasions afterwards. The last appearance of the Wandering Tattler for the season was on September 19th. There is some doubt whether or not this was an adult.

It is unsafe to draw any definite conclusions about the breeding range of this species, with nesting data from only one locality . . . Practically all the streams emerging from the Alaska Range have certain characteristics in common. They are rapid, divided into many channels, flowing through gravel formation. Observations indicate that such is the environment chosen by the Wandering Tattler.

Order PSITTACIFORMES.

Family PLATYCERCIDÆ.

No. 62.

BARNARDIUS CROMMELINÆ.

ALLIED MALLEE PARROT.

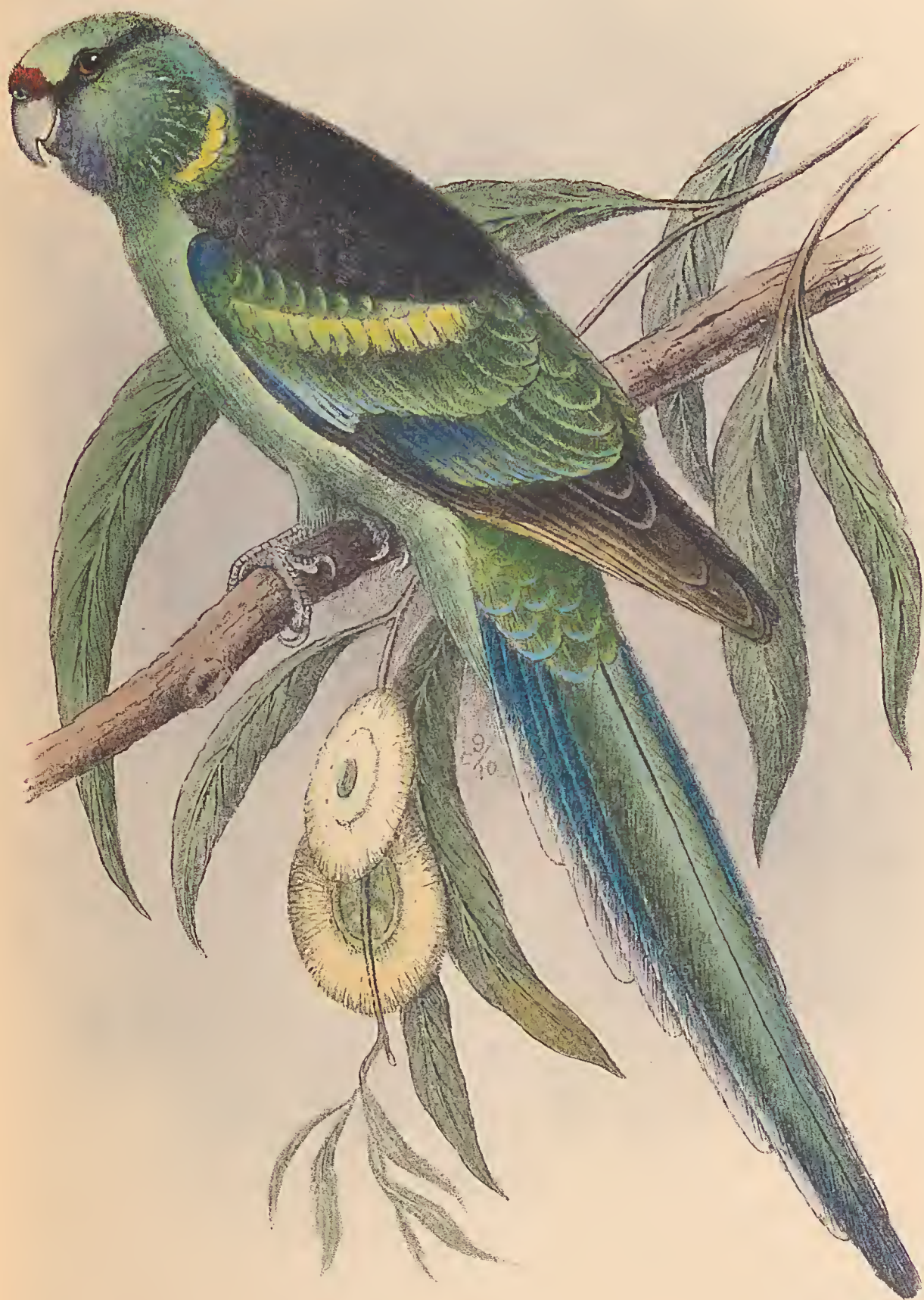
(PLATE 43.)

BARNARDIUS CROMMELINÆ Mathews, Bull. Brit. Orn. Club, Vol. XLVI., p. 21, Nov. 4th, 1925 :
Australia (?); Tavistock, Avicultural Mag., Ser. IV., Vol. V., No. 6, p. 145 (and coloured
plate), June 1927.

DISTRIBUTION. Australia (?).

Adult female. Back and scapulars dull dark blue-grey; primaries and secondaries black, the outer webs bluish; wing-coverts with the inner webs black, outer green or greenish-yellow; bend of wing blue; upper tail-coverts green with a bluish tip to the feathers; tail-feathers with the central pair greenish-blue, getting bluer towards the tip, remainder blue at the base getting whiter towards the tips; a well-developed red frontal band; top of the head pale green; a band from the eye and over the nape brownish; a dark V-shaped mark of dull green at the back of the head; lores black; cheeks blue; sides of the face green with a white mark on each feather; a yellow patch on each side of the neck; entire under-surface blue-green. Bill and feet horn-colour; eyes brown. Total length 300 mm.: wing 135, culmen 18, tail 163, tarsus 18. Measurements approximate, taken from a live bird.

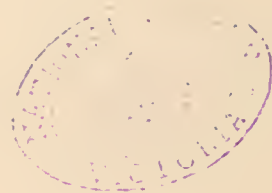
I HAVE had this plate prepared in the hope that it will help others to decide on its validity.



H. Gronvold del

Witherby & Co

BARNARDIUS CROMMELINAE
(ALLIED HALCYON PARROT.)



Order PASSERIFORMES.

Family MUSCICAPIDÆ.

No. 63.

CARTERORNIS LEUCOTIS.

WHITE-EARED FLY-CATCHER.

Mathews, Birds Austr., Vol. IX., pt. 2, p. 90, pl. 410, April 15th, 1921.

Monarcha leucotis Mayo, Emu, Vol. XXIII., pt. 1, p. 30, pl. VII., July 4th, 1923 (nest); Campbell, *ib.*, Vol. XXV., pt. 3, p. 151, Feb. 11th, 1926 (eggs).

Nest. Formed of thin strips of tea-tree bark with green moss woven amongst and over the tea-tree; largely covered outside with cobweb-like plant or aphis; interspersed with a white hair-like filament; inside lining of nest black hair-like roots of fern. Built on a sloping forked limb 10 to 12 feet from the ground. Measurements: diameter 3 inches, depth $3\frac{1}{2}$ inches; inner diameter 2 inches, depth $1\frac{1}{2}$ inches.

Eggs. Clutch three. Short ovate in shape; texture of shell fine; surface very glossy; colour pinkish-white, somewhat heavily spotted and blotched with rich chocolate or madder brown and violet-slate or purplish-grey. 20-22 by 15-16 mm.

Breeding-season. October (Pimpana, South Queensland).

SAMUELA CASTANEOTHORAX.

CHESTNUT-BREASTED QUAIL-THRUSH.

(PLATE 44.)

SAMUELA CINNAMOMEA Mathews, Birds Austr., Vol. IX., pt. v., p. 196, Dec. 15th, 1921 : Partim ;
id., Vol. XII., pt. 10, pp. 427-428, Feb. 8th, 1927.

Cinclosoma castaneothorax A. J. Campbell, Emu, Vol. XXV., pt. 3, p. 152, Feb. 11th, 1926.

Adult male. Crown of the head, occiput, nape and hind-neck dull earth-brown, each feather with a concealed mesial streak of brownish-black ; a line of whitish-buff feathers round the base of the bill and continued over the eye ; lores black ; a broad band of snow-white feathers from the angle of the mouth, continued along the sides of the throat and surrounding the throat, which is glossy bluish-black ; ear-coverts and cheeks dull earth-brown ; fore-neck and chest bright reddish-cinnamon ; a large patch of black feathers, tipped with white, on the upper-breast ; lower-breast and belly pure white, black at the base ; sides of the body and flanks cinnamon-brown faintly washed with white towards the tips of the feathers ; thighs earth-brown ; under tail-coverts very long, blackish-olive, tipped and margined with white and with blackish shafts ; under wing-coverts white ; axillaries dull olive, quills below dull grey, whitish on the outer web. Total length 235 mm. : culmen 15, wing 100, tail 100, tarsus 28. Figured. Collected at Barearolle, West Central Queensland, on the 4th of September, 1925.

Adult female. Head, nape, hind-neck and mantle dull earth-brown ; scapulars brownish-chestnut, with faint black mesial shaft-streaks ; lower back, rump and upper tail-coverts reddish-chestnut with the shafts black ; wing-coverts black, broadly tipped with pure white ; quills dark ash, very faintly margined with white ; secondaries dark ash very faintly margined with white ; secondaries dark ash, very broadly margined on the outer web with chestnut-buff ; middle pair of tail-feathers uniform dark brownish-ash ; remainder of the tail-feathers deep black, broadly tipped with pure white ; lores and eyebrow cinnamon-buff ; sides of the face and ear-coverts brownish-buff ; chin and throat cinnamon ; fore-neck and chest greyish-chestnut ; sides of the body, flanks and thighs chestnut-cinnamon ; middle of the chest, breast and belly pure white ; under tail-coverts greyish-chestnut, margined towards the extremity and at the tip with white ; under wing-coverts white, quills below light grey. Bill black, iris brown, feet leaden. Total length 232 mm. : culmen 15, wing 98, tail 93, tarsus 28. Figured. Collected at Adavale-Charlesville Road, Queensland, on the 27th of August, 1923.

THIS form is considered a species by some workers ; I have had a plate prepared which can be compared with the plates given in my *Birds of Australia*, Vol. IX., pls. 425-6.



H. Grönvold. del

SAMUELA CASTANEOTHORAX
(CHESTNUT-BREADED QUAIL THRUSH.)

Witherby & Co



H. G. S. enfold del.

Witherby & Co.

CISTICOLA JUNCIDIS
FANTAIL WARBLER.

CISTICOLA JUNCIDIS.

(NORMANT)

FANTAIL WARBLER.

(PLATE 45.)

CISTICOLA Kaup, Skizz. Entwick. Gesch. Nat. Syst., p. 119, 1829, pref. April. Type (by tautonymy): *Sylvia cisticola* Temminck.

SYLVIA JUNCIDIS Rafinesque, Caratteri Alc. nuovi. Gen. Spec. Anim. Sicilia, p. 6, spec. 10, 1809: Sicily (fig. Gould, Europe, pl. 113; Dresser, Vol. III., pl. 96).

Cisticola cisticola Sharpe, Cat. Birds Brit. Mus., Vol. VII., p. 259, 1883, pref. July 1st.

Cisticola exilis normani Mathews, Austral. Av. Rec., Vol. II., p. 98, Sept. 24th, 1914: Norman River, West Queensland; Mathews, Emu, Vol. XXVI., pt. III., p. 223, Jan. 1927; *id.*, Birds Austr., Vol. XII., pt. 10, p. 430, Feb. 8th, 1927: Normanton.

DISTRIBUTION. Gulf of Carpentaria, Queensland.

Adult male. Top of the head olive-brown, some of the feathers indistinctly margined with lighter-olive; a narrow white eye-brow continued on to the lores; back of the neck and upper mantle ash-grey, each feather bordered with olive-yellow; feathers of the mantle blackish-brown, margined with whitish-buff; lower back and rump rusty-rufous; upper tail-coverts brownish-black, margined with yellowish-white; wings ash-brown, narrowly margined on the outer web with whitish; middle tail-feathers ash-grey, broadly barred towards the extremity with black and tipped with greyish-white; third innermost pairs of tail-feathers with a large oval spot of rust-colour on the inner web and with a broad bar of black across the extremity, tipped with white; under-parts white, washed with rufous on the sides of the body; iris hazel; bill grey; feet pink. Total length 90 mm.: exposed culmen 9, wing 49, tail 29, tarsus 19.5. Figured. Collected at Normanton, Queensland, on the 27th of March, 1914. Summer plumage.

Adult female in summer plumage more like that of the winter plumage of both sexes.

Adult female. Top of the head light straw-colour with very broad streaks of black from the base of the culmen over the head to the neck; back of the neck and upper mantle golden-brown, each feather with brownish middles; back and scapulars deep brownish-black, bordered all round with pale straw-colour; lower back and rump rusty-rufous; upper tail-coverts rusty-rufous but with a broad mesial streak of dark brown; primaries and secondaries ash-brown, bordered on the outer web with tawny-rufous; middle pairs of tail-feathers dark blackish-brown, margined on both webs and broadly tipped with rufous; remainder of the tail-feathers dull blackish-brown, widely barred with black towards the extremity; tips of the feathers broadly white; under-surface white, very strongly washed with rich rufous down the sides of the body and flanks; iris grey; bill pale horn-colour; feet pale flesh-colour. Total length 95 mm.: exposed culmen 9, wing 45, tail 35, tarsus 19. Figured. Female collected at Normanton, Queensland, on the 29th of April, 1914.

Winter. In the winter the sexes are alike.

I ADDED this form to the Australian List in January, 1927, in the *Emu*, Vol. XXVI., pt. III., p. 223. Admiral H. Lynes, who has monographed this genus, drew my attention to birds in my collection at Tring which I had treated as sub-species of *Cisticola exilis*.

Order PASSERIFORMES.

Family MUSCICAPIDÆ.

No. 66.

PSEUDOGERYGONE FLAVIDA.

FAIRY WARBLER.

PSEUDOGERYGONE PALPEBROSA Mathews, Birds Austr., Vol. VIII., pt. III., p. 177 (pl. 387), Aug. 18th, 1920 : Partim.

Gerygone flavida of Ramsay ; Chisholm, Emu, Vol. XXIV., pt. III., p. 161, pl. 24, Jan. 1925.

Nest is a small domed-shaped structure, with an entrance on the side, hooded over with a small verandah, and usually a small narrow tail hangs from the bottom of the nest. Constructed of small strips of soft bark and bound together with cobwebs. Measurement of nest overall (without tail) nearly five inches, the tail sometimes being nearly as long as the nest. The structure is generally placed in a small tree or bush, and suspended from the end of a thin twig.

Eggs. Two to three eggs form the clutch. A pair taken near Cardwell, at the northern end of Hinchinbrook Island, North Queensland, on the 15th of October, 1908, is of a very pale pinkish-white ground-colour, rather well spotted and speckled (particularly at the larger end) with pale to dark reddish-brown. Oval in shape, rather pointed at the smaller end ; surface of shell fine and smooth and slightly glossy. The pair measures (A) 17 by 12 mm. (B) 17 by 12 mm.

CALAMANTHUS WINIAM.

WINIAM FIELD-WREN.

CALAMANTHUS WINIAM A. J. and A. G. Campbell, Emu, Vol. XXVII., pt. II., p. 80, Oct. 17th, 1927 : Winiam, South of Nhill, Victoria. *Cf. ib.*, pt. III., p. 221, Jan. 4th, 1928 ; *id.*, *ib.*, pt. IV., p. 223, coloured plate 31, April 3rd, 1928.

I HAVE not seen either of the above birds. I shall figure them as soon as I obtain specimens.

Order PASSERIFORMES.

Family SYLVIIDÆ.

No. 67.

GEOBASILEUS HEDLEYI.

DARK THORNBILL.

GEOBASILEUS HEDLEYI Mathews, Birds Austr., Vol. IX., pt. III., p. 479, pl. 453, Aug. 3rd, 1922 ;
A. J. and A. G. Campbell, Emu, Vol. XXIII., pt. III., p. 220, Jan. 11th, 1924.

MESSRS. A. J. and A. G. CAMPBELL, who examined the type of *Acanthiza winiamida* Wilson, say that it is a sub-species of *Acanthiza hedleyi* Mathews, and not of *Acanthiza iredalei* Mathews. They also describe the nest and eggs.

Nest. Covered, with top-side entrance, slightly hooded ; composed chiefly of weather-beaten grass stems mixed with a few spiders' or insect cocoons, and warmly lined with small feathers. Upright diameter $4\frac{1}{2}$ inches (115 mm.) ; breadth about 3 inches (75 mm.). Situated near the ground in a banksia bush.

Eggs. Clutch three ; ovate in shape ; texture of shell very fine ; surface glossy, white, minutely freckled or "dusted" with light brick-red in the form of a zone round the apex. 15.5 to 16 mm. by 11.5 mm.

Breeding-season. [August] September.

Order PASSERIFORMES.

Family SYLVIIDÆ.

No. 68.

DIAPHORILLAS MODESTA.

THICK-BILLED GRASS-WREN.

Mathews, Birds of Australia, Vol. X., p. 183, pl. 468, Jan. 30th, 1923.

Nest. Large, very loosely constructed and half-domed, with large opening on the side composed of dead, well-bleached grasses, strips of soft bark, etc. ; lined with very soft, decayed grasses. Height over all $6\frac{1}{2}$ inches, width $4\frac{3}{4}$ inches, opening $2\frac{1}{2}$ inches high by $2\frac{1}{4}$ inches across, depth from front to back (inside) 2 inches. Placed on the ground and sheltered by cane-grass.

The eggs are given at the above reference.

Breeding-season. September (See *Emu*, Vol. XXIII., p. 269, 1924).

Order PASSERIFORMES.

Family SYLVIIDÆ.

No. 69.

DIAPHORILLAS INEXPECTATUS MYALL.

EASTERN GRASS-WREN.

Mathews, Birds of Australia, Vol. X., p. 186, pt. III., pl. 469, Jan. 30th, 1923.

CONSIDERED by Dr. A. M. Morgan as a sub-species of *D. textilis*, when he described the nest and eggs in the South Australian Ornithologist, Vol. VII., pt. 5, p. 159, Jan. 1st, 1924. He also corrects the locality from Cariewerels to Cariewerloo, a station on Myall Creek, twenty-two miles west of Port Augusta in the Gawler Ranges, South Australia.

Nest. Situated 9 inches from the ground in a saltbush, well away from the scrub. The shape was an open cup, with no sign of a hood or other covering. The base was of very fine dead twigs of saltbush, on which the nest proper was built of very fine, dried, old grasses of a grey colour, matching well with the stems of saltbush, and scantily lined with rabbit fur. It was well concealed by an overhanging branch of the bush. Measurements: height overall $3\frac{3}{4}$ inches; cavity, diameter $2\frac{1}{2}$ inches; depth $1\frac{1}{2}$ inches.

Eggs. Clutch three. Short ovals in shape, surface smooth with a slight lustre. The ground-colour of two of the eggs is a pale reddish-brown thickly covered with spots and splashes of bright red. The third egg has a white ground-colour, with markings of the same shape and colour as the other two. In all, the spots are more thickly distributed at the larger end. Measurements: 22-23 by 16-17 mm.

Breeding-season. August (September). Collected on the 30th of August, 1923, near Wertigo Dam, about 50 miles S.S.W. of Port Augusta.

Order PASSERIFORMES.

Family SYLVIIDÆ.

No. 70.

DIAPHORILLAS PURNELLI.

UNIFORM GRASS-WREN.

Mathews, Birds of Australia, Vol. X., p. 190, pt. III., pl. 472, Jan. 30th, 1923.

THE nest and eggs of this species were collected by Mr. F. L. Whitlock, near Hermansburg, Central Australia, during September, 1923, and described by Mr. H. L. White in the *Emu*, Vol. XXIII., pt. 4, p. 241, April 4th, 1924.

Nest. A comparatively large and half-domed structure, very loosely composed of fine, dried, soft grasses. Height over all $5\frac{1}{2}$ inches; width $5\frac{1}{4}$ inches, opening $2\frac{1}{2}$ inches across; depth from front to back (inside) 2 inches. Built near the ground in a clump of *Triodia* or Porcupine-grass.

Eggs. Clutch two. Swollen ovals in shape, surface of shell fine and rather glossy. Ground-colour pale pinkish-white, well marked all over with minute specks and blotches of light to dark reddish-brown, the markings becoming much larger and crowded at the larger end and forming an irregular cap. 19-21 by 15-16 mm.

Breeding-season. September (See *Emu*, Vol. XXIII., p. 271, 1924).

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